



May 2018

GI News is published by the University of Sydney, School of Life and Environmental Sciences and the Charles Perkins Centre. 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

WHY IS PUSS PORTLY?

As our waistlines have expanded, so have those of our pets. The Association for Pet Obesity Prevention's ninth annual clinical survey (2016) reports that nearly 54 percent of dogs and 59 percent of cats were clinically overweight or obese in the US. To put some numbers on that, they reckon that equals an estimated 41.9 million dogs and 50.5 million cats (based on 2016 pet population projections provided by the American Pet Products Association). Being overweight puts puss and puppy at an increased risk for weight-related disorders such as type 2 diabetes, osteoarthritis, hypertension and many cancers.

A recent Swedish cross-sectional study using data from medical records for cats visiting an academic medical centre and from a questionnaire on insured cats found that the factors associated with increased risk of puss being obese were: "Eating predominantly dry food, being a greedy eater, and inactivity".

What's the ideal weight for a cat? *The Cat Bible* author and Radio Pet Lady, Tracie Hotchner, says "it is hard to judge since cats come in so many shapes and sizes. However, if your cat has a belly that hangs down and swings when she walks, you need to make some plans to reduce her weight. Oftentimes this will simply mean removing all dry food and feeding canned or raw instead, which research shows is the best diet for every cat."

Dry food is not appropriate for domestic cats she says. “Numerous veterinarians who share my dismay over the widespread use of dry food are concerned about a cat's digestive system being challenged to process foods it is not designed to eat. Cats are not ‘little dogs’ yet a dry food developed for canines was then manipulated to give to cats.” Hotchner views dry food for cats as an addictive harmful source of nutrition which she calls ‘kitty crack’ as she believes it encourages felines to consume carbohydrate-heavy plant-based food sources which their body is not designed to digest and metabolize. Keep in mind the wild ancestors of puss snoozing on the sofa were obligate carnivores and their diet was essentially the small animals they hunted. Despite appearances, the domestic cat still closely resembles its wild ancestor.

Who thought of dried food for cats and dogs? And when? It has a fascinating past as *GI News* editor Philippa Sandall discovered researching *Seafurriers*, her book on ships’ cats. The story goes that in the late 1850s, an Ohio electrician named James Spratt journeyed to London to sell lightning rods. He noticed dogs hanging around the docks at Portsmouth tucking into scraps of hardtack (ship’s biscuit) and had a eureka moment. He patented a similar biscuit for dogs (they can digest carbohydrate-based foods) and the rest is history. Spratt’s Patent Meal Fibrine Dog Cakes were a baked mixture of wheat, beet root, and vegetables bound together with beef blood. Dried food (kibble) for cats followed.

To whet your appetite, here’s a World War 2 “dry food incident” reported by a 17-year-old Massachusetts seaman who saved the ship’s cat after they were torpedoed. “We were in the lifeboat seven and a half days with not much to eat besides hardtack,” he said. “The cat didn’t like hardtack and wouldn’t eat a bite until some flying fish landed in the boat. Before we got to shore, though, she ate hardtack and liked it.” It’s likely the lifeboat lad improvised a grainy seafood salad to tempt puss’s taste buds (and his own) by tossing crumbled hardtack with flying fish flakes moistened with a little water and puss focussed her attention on the fishy bits surmises *Seafurriers* author Philippa Sandall.

Read more:

- [Overweight in adult cats: a cross-sectional study](#)
- [Cats and Carbohydrates](#)
- [Radio Pet Lady](#)
- [Seafurriers. The Ships’ Cats Who Lapped and Mapped the World](#)

WHAT’S NEW?

DIABETES IN CATS

Diabetes in cats resembles type 2 diabetes in people. The causes aren’t fully understood, but both genetic and environmental factors are believed to contribute. However, for those quick to point the wagging finger at “sugar” causing obesity and diabetes, cats don’t eat sugar. They don’t have a sweet tooth. A small Swedish case-control study using a web-based questionnaire sent to owners of cats with diabetes and cats without diabetes (the control) found indoor confinement, being a greedy eater, and being overweight were associated with an increased risk of diabetes. As dry food is commonly fed to cats worldwide, “the association found between dry food and an increased risk of diabetes in cats assessed as normal weight by owners warrants further attention” say the authors.

In Perspectives this month, Alan Barclay looks at the pancreas, what it is and what it does, and why understanding the causes of diabetes are complicated in people let alone in cats.

Read more:

- [Environmental Risk Factors for Diabetes Mellitus in Cats](#)

HIGH FIBRE DIET MAY HELP MANAGE BGLS

A high fibre diet rich in good carbs (fruit, veg, beans and grains) can help people with type 2 diabetes manage their blood glucose levels – and it seems to do this by changing the bacteria in the gut. The findings of a recent study showed a diversified high-fibre diet can promote some 15 strains of gut bacteria that produce short-chain fatty acids that can help in reducing inflammation in the gut, help regulate hunger and also provide energy to gut cells. “It’s early days,” says study leader Prof Liping Zhao from Rutgers University, “but it lays the foundation and opens the possibility that fibres targeting this group of gut bacteria could eventually become a major part of your diet and your treatment”. The research reinforces the fact that eating certain kinds of carbohydrate foods rich in dietary fibres can help restore the gut microbiota responsible for better digestion and overall health.

Read more:

- [Gut bacteria selectively promoted by dietary fibers alleviate type 2 diabetes](#)

IT’S NOT JUST IN YOUR HEAD: SEROTONIN AND OBESITY

Maybe it’s not on the tip of every tongue writes Ted Kyle in ConscienHealth. But serotonin is a bit more familiar than most neurotransmitters. Most people think of it as a happy hormone for the central nervous system that becomes depleted in a state of depression. However, the gastrointestinal system has far more of it than the central nervous system. And new research now tells us that in the small intestine, this substance might influence obesity and metabolic health.

Scientists have long known that serotonin in the brain plays a role in eating behaviour. Food intake is higher when levels of this hormone are lower in the brain. But animal studies have suggested a very different relationship between serotonin and obesity in the gut. There, it seems to promote obesity and higher blood glucose levels. Now, we have confirmation in humans that this is true. Richard Young and colleagues showed that the small intestines of people with obesity produce more serotonin. In fact, the levels were twice as high when compared to normal controls. The gut secretes this hormone in response to glucose and it appears to play a role in developing obesity and diabetes.

This research is important for two related reasons says Kyle. First, it gives us more insight into how both obesity and diabetes develop, and why some people are more susceptible than others. In their research, Young et al found more cells that produce serotonin in the small intestines of people with obesity than in those at a normal weight. With a better understanding of this pathway, we might have a promising new target for treating obesity and diabetes. Says Young: “This has revealed new ways that we may be able to control the release of serotonin from within the gut, and in turn, further improve the outlook for people living with obesity.”

Read more:

- [Augmented capacity for peripheral serotonin release in human obesity](#)
- [Obesity trigger identified within the human gut](#)

PERSPECTIVES: DR ALAN BARCLAY

THE PANCREAS – UNLOVED, BUT ESSENTIAL

The pancreas is an essential organ responsible for both the digestion of food and blood glucose regulation. It was first identified by Greek anatomist and surgeon, Herophilus, around 2300 years ago. A few hundred years later, Rufus of Ephesus, another Greek anatomist, gave the pancreas its name. “Pancreas” originally meant sweetbread, a name that is still commonly used in culinary circles for calf or lamb pancreas.

The pancreas is located behind the stomach in the upper left part of the abdomen. It is surrounded by other organs including the stomach, small intestine (duodenum), liver, and spleen. It is spongy, about 15–25cm (6–10in) long, 2.5cm (1in) thick, and is shaped a bit like a flattened pear or a fish extended horizontally across the abdomen. The bulk (95%) of the pancreas consists of tissues and cells that produce pancreatic secretions for the digestion of carbohydrates, fats and proteins. The remainder consists of little islands of cells called islets of Langerhans. These look a bit like small bunches of grapes and produce hormones that regulate blood glucose and help regulate pancreatic digestive secretions.

Food digestion Once food has been chewed in the mouth, then mulched and partially digested in the stomach by acids, it is released into the first part of the small intestine known as the duodenum. The pancreas then releases its own digestive juices and enzymes into the partially digested food, via a small duct connected to the duodenum. Pancreatic juices contain enzymes that help breakdown carbohydrate, fat and protein. They are activated once they reach the duodenum to prevent the protein-digesting enzyme trypsin from breaking down the proteins in the pancreas itself, or in its duct. Other enzymes produced by the pancreas and released into the duodenum include amylase (to break down starches and maltodextrins into sugars) and lipase (to break down fats into monoglycerols and fatty acids). The pancreas also secretes sodium bicarbonate, which helps to neutralise the stomach acids in the partially digested food.

Blood glucose hormones Two of the most important pancreatic hormones are insulin produced by beta cells and glucagon produced by alpha cells in the islets of Langerhans which manufacture and release these hormones directly into the bloodstream.

Insulin regulates the metabolism of carbohydrates, fats and protein by promoting the absorption of glucose from the blood into liver, fat and muscle cells. In these cells the absorbed glucose is converted into either glycogen (a kind of starch found in the liver and muscles) via a process known as glycogenesis or fats (triglycerides) via lipogenesis. Circulating insulin also affects the synthesis of proteins in a wide variety of cells and tissues. It is therefore an anabolic hormone, promoting the conversion of small molecules in the blood into large molecules inside the cells.

Glucagon stimulates the liver to break down glycogen into glucose, which is then released into the blood. It also activates gluconeogenesis, the conversion of certain amino acids from

proteins into glucose. Finally, it facilitates the breakdown of stored fat (triglycerides) into fatty acids for use as fuel by cells. It is therefore a catabolic hormone, promoting the breakdown of large molecules in cells into smaller molecules in the blood.

Pancreatic beta cells are sensitive to blood glucose concentrations. When glucose levels are high, they secrete insulin into the bloodstream and when glucose levels are low, secretion of insulin is inhibited. On the other hand, alpha cells secrete glucagon into the blood in the opposite manner to insulin: when blood glucose levels are low, or in response to vigorous exercise, secretion is increased, and when blood glucose levels are high, secretion is decreased.

The secretion of insulin and glucagon into the blood in response to changes in blood glucose concentrations is the primary mechanism of blood glucose homeostasis. In other words, the two hormones work in partnership with each other to keep blood glucose levels balanced. Optimal maintenance of blood glucose levels is critical to the functioning of key organs including the brain and nervous system, liver, and kidneys.

If the beta cells are destroyed by an autoimmune reaction, insulin can no longer be synthesized or secreted into the blood in sufficient quantities. This results in the development of type 1 diabetes. In type 2 diabetes, the destruction of beta cells is less pronounced than in type 1 diabetes and is not primarily due to an autoimmune process. The exact cause of type 2 diabetes is not fully understood but people have a reduced number of islet beta cells, and of those that survive there is a reduced secretory function, and there is also frequently (but not always) peripheral tissue insulin resistance (the insulin that is produced does not work as efficiently in the target cells as it should). Type 2 diabetes is also characterized by high rates of glucagon secretion which are less responsive to the concentration of glucose in the blood, but insulin is still secreted into the blood in response to concomitantly increasing blood glucose concentrations. As a result, insulin levels are typically much higher than they are in people without type 2 diabetes.

Read more:

- [The pancreas and diabetes](#)
- [Insulin](#)
- [Glucagon](#)



Alan Barclay PhD is a consultant [dietitian](#). He is author of *Reversing Diabetes* (Murdoch Books), and co-author of 30-plus scientific publications, *The Good Carbs Cookbook* (Murdoch Books), *Managing Type 2 Diabetes* (Hachette Australia) and *The Ultimate Guide to Sugars and Sweeteners* (The Experiment Publishing). Follow him on [Twitter](#) or check out his [website](#).

KEEPING IT GREEN – EATING FOR BODY AND PLANET

LOW ENERGY LIVING

We use a lot of energy in our everyday lives. Cast your mind back to the last power outage. Did your heart sink as you realised that your mobile battery was at 2%, you couldn't watch

TV or make microwave popcorn and the ice-cream in the fridge melted? The minor and temporary inconvenience of a power outage is the tip of a very large energy iceberg.

Each year we are using more and more energy. One way of measuring how much more we are using is Overshoot Day. In 2017, August 2 was Overshoot Day says the [Global Footprint Network](#). What this means is that in just over seven months, we, the world's population, had used up the natural resources such as food and fuel Earth can generate in twelve months. As Overshoot Day moves earlier and earlier each year, we dip more and more into the super fund of natural resources we should be saving for our children's and their children's future. What can we do to make a difference? We can start with adopting some everyday habits that help to reduce our energy use. We don't necessarily have to go without; but we need to be more aware of the energy we use in our daily lives, be more energy efficient and waste less.

Our energy-saving tips

Transport

- Walk, ride a bike, carpool or take public transport – it saves money and reduces your carbon footprint as well as increasing your activity levels. Talk about win, win, win!

Shopping

- Buy healthy whole foods such as oats, brown rice, vegetables, fruit, milk, fresh meat, legumes and eggs, and cut back on (cut out?) highly processed packaged foods that require more energy to produce in the first place and are likely high in salt, saturated fats and highly refined carbohydrates (starches and sugars) that spike BGLs.
- Plan your meals and shopping trips to avoid emergency fast food drive-throughs and pizza deliveries.

Cooling and heating

- Adjust your air-conditioning thermostat to more moderate settings to make it use less energy, such as 18–20 degrees Celsius in winter and 25–27 degrees in summer.
- Wear more clothes in winter to save on heating (and remember keeping yourself warm uses kilojoules/calories and every little bit helps).
- Close the door on rooms you're not using and exclude draughts.

Washing

- To save energy on water-heating, wash clothes in cold water, only run the dishwasher when its full (and in the middle of the night for off-peak energy pricing), keep showers short and install a water-saving shower head and flow-limiters on taps.
- Air-dry clothes rather than use a clothes dryer.

Storage

- Ensure your fridge is set to the correct temperature – around 3–4 degrees Celsius and get rid of that extra fridge – it's costing you a lot to run.
- Don't open the fridge door too much so it doesn't have to work as hard to stay cold.

Cooking

- Use the BBQ outside on hot days – cooking inside heats the house and makes your cooling system work harder.
- Use your microwave oven or pressure cooker rather than your oven – it is more energy efficient.
- Defrost frozen foods in the fridge overnight instead of in the microwave.
- Use the correct size burner for your saucepan – excess heat wastes energy.

- If using your oven, think about cooking two things at once.

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 A TO Z

ORANGES

The golden glow of oranges in the midst of a grey winter lift spirits. It's not just colour. Their sweet acidity makes them a versatile ingredient in the kitchen (variety doesn't matter so much, although some recipes specify blood oranges or Seville oranges for colour or flavour). Whole oranges (skin and all), segments, juice and zest are used in every category of cooking from salads, soups, sauces, meat, fish, poultry to desserts and baking.

As citrus fruit does not ripen further once it has been picked, choose ripe oranges that smell like oranges with no hint of fermenting aromas. Heavy fruits with fine-grained skin are juiciest. Avoid soft, bruised or wrinkled fruit as well as spongy soft ones. They keep for up to two weeks in the refrigerator and almost as well at room temperature. They also yield more juice at room temperature. Their sturdy peel protects them and they require no further wrapping.

Good Carbs Food Facts	
Oranges	
★ ★ ★ ★ ½	
Glycemic index 42	
Gluten free	
Serving size – 1 medium orange, peeled (130g/4½oz)	
Kilojoules	225
Calories	54
Protein	1.5g
Fats – Total	0g
--Saturated fat	0g
–Unsaturated fat	0g
–Cholesterol	0g
Saturated : unsaturated fat ratio	0.0
Carbohydrates – Total	12.5g
<i>Available</i>	10g
--Natural sugars	10g

–Natural starches	0g
–Added sugars	0g
–Added starches	0g
<i>Unavailable</i>	
–Dietary fibre	2.5g
Sodium	3mg
Potassium	190mg
Sodium : potassium ratio	0.02
Glycemic load	4
Diabetes exchange	1
Ingredients: Orange	

Source: [The Good Carbs Cookbook](#)

IN THE GI NEWS KITCHEN

THE GOOD CARBS COOKBOOK

	<p>The Good Carbs Cookbook (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 explains how to use them in 100 refreshingly nourishing recipes to enjoy every day, for breakfast, brunch, lunch, dinner and dessert. The recipes are easy to prepare, (mostly) quick to cook, long in flavour and full of sustaining goodness, so you feel fuller for longer. There is a nutritional analysis for each recipe and tips and helpful hints for the novice, nervous, curious or time-starved cook.</p>
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FREGOLA AND BLOOD ORANGE SALAD WITH FENNEL

Every ingredient in this lively salad says Italy. Red-fleshed blood oranges were developed in Sicily, while subtle, aniseedy fennel is everywhere in Italy. Fregola is a type of Sardinian pasta, not dissimilar to couscous. During processing, the durum wheat flour is mixed with water, rolled into tiny pebbles, sundried and roasted giving it a rustic quality. The flavour is improved if the fregola is cooked in a flavoursome stock. It should take no more than 10–12 minutes of cooking to be al dente. You can substitute with Israeli (pearl) couscous or orzo if you wish. Preparation time: 25 minutes • Cooking time: 12 minutes • Serves: 6

2 cups fregola
 4 blood oranges
 4 flat anchovy fillets, drained
 1 garlic clove, peeled
 ½ teaspoon chilli flakes
 3 tablespoons lemon juice
 3 tablespoons olive oil
 1 medium fennel bulb, trimmed and thinly sliced
 freshly ground pepper

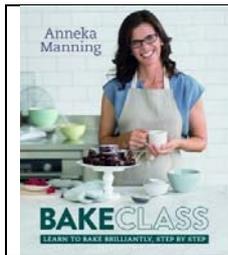
Bring a medium pan of salted water to the boil and add the fregola. Boil for about 15 minutes or until cooked through. Drain, refresh under cold water and set aside to drain and dry. • Slice the peel and white pith from the oranges and slice into thin rounds. Arrange in a

circular pattern on a serving dish. • Mash the anchovies with the garlic and chilli flakes and then whisk in the lemon juice and oil. • Put the well-drained and cooled fregola and the fennel in a bowl, add the anchovy dressing and toss to combine all the ingredients. Pile the mixture on top of the oranges and season generously with pepper.

Per serve

1050kJ/250 calories; 6g protein; 10g fat (includes 1.5g saturated fat; saturated : unsaturated fat ratio 0.18); 33g available carbs (includes 8.5g sugars and 24.5g starches); 4.5g fibre; 165mg sodium; 315mg potassium; sodium : potassium ratio 0.52

ANNEKA MANNING'S BAKE CLUB



Anneka Manning is an author, food editor, cooking teacher, home economist, mother of two and the founder of BakeClub. With over 27 years' experience, she specialises in teaching the 'why' behind the 'how' of baking, giving home cooks the know-how, understanding and skill to bake with confidence and success, every time. You can follow her on [Twitter](#), [Facebook](#) or check out her [website](#).

MANDARIN ROASTED ALMOND CAKES.

These gluten-free cakes are a play on the original (and wonderful) Middle Eastern orange cake from the one-and-only Claudia Roden. The ground roasted almonds give a lovely 'toasted' flavour but you can substitute pre-ground almond meal. To roast and grind the almonds, spread on an oven tray and place in an oven preheated to 180°C/350°F for 8-10 minutes or until aromatic. Cool on the tray before processing in a food processor until finely ground. Makes: 12 • Prep: 20 minutes (+ 30 minutes simmering and 15 minutes cooling time) • Bake: 15–18 minutes

2 large mandarins
olive oil spray, to grease
½ cup instant polenta
80g (2½oz) natural almonds, roasted, finely ground
½ tsp baking powder
3 eggs, at room temperature
¾ cup raw caster sugar
2 tsp natural vanilla essence or extract
icing sugar, to dust (optional)

Put the mandarins (skin and all) in a small saucepan and cover with water. Bring to the boil and simmer for 30 minutes or until very soft when tested with a skewer. You may need to place a small saucer over the mandarins to keep them submerged. Remove from the water and set aside to cool slightly. • Meanwhile preheat the oven to 180°C (350°F). Brush a 12-hole 80ml (⅓-cup) muffin tin with the melted butter to grease. • Combine the polenta, roasted almond meal, and baking powder in a medium bowl and mix well to combine evenly. • Quarter the mandarins and remove and discard any centre core or seeds. Puree in a food processor or blender until smooth. • Put the eggs, sugar and vanilla in a medium mixing bowl and use an electric mixer with a whisk attachment to whisk until very thick and pale and a ribbon trail forms when the whisk is lifted. Add the mandarin puree and use a

spatula or large metal spoon to fold in until just combined. Add the polenta mixture and fold together until evenly combined. • Divide the mixture evenly among the muffin holes (pouring the mixture from a jug or using a ladle works well). • Bake in preheated oven for 15-18 minutes or until the cakes are firm to the touch on the top and cooked when tested with a skewer. Remove from the oven and cool in the tin for 10 minutes. Use a palette knife to ease the cakes out of the tin and transfer to a wire rack. Serve warm or at room temperature dusted with a little icing sugar if you wish.

Per cake

Energy: 560kJ/130cals; Protein 3.5g; Fat 5g (includes 1g saturated fat; saturated : unsaturated fat ratio 0.25); Available carbohydrate 18.5g (includes 15g sugars, 3.5g starches); Fibre 1g; Sodium 40mg; Potassium 95mg; sodium to potassium ratio 0.42

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