

Managing food for children and young people with type 1 diabetes

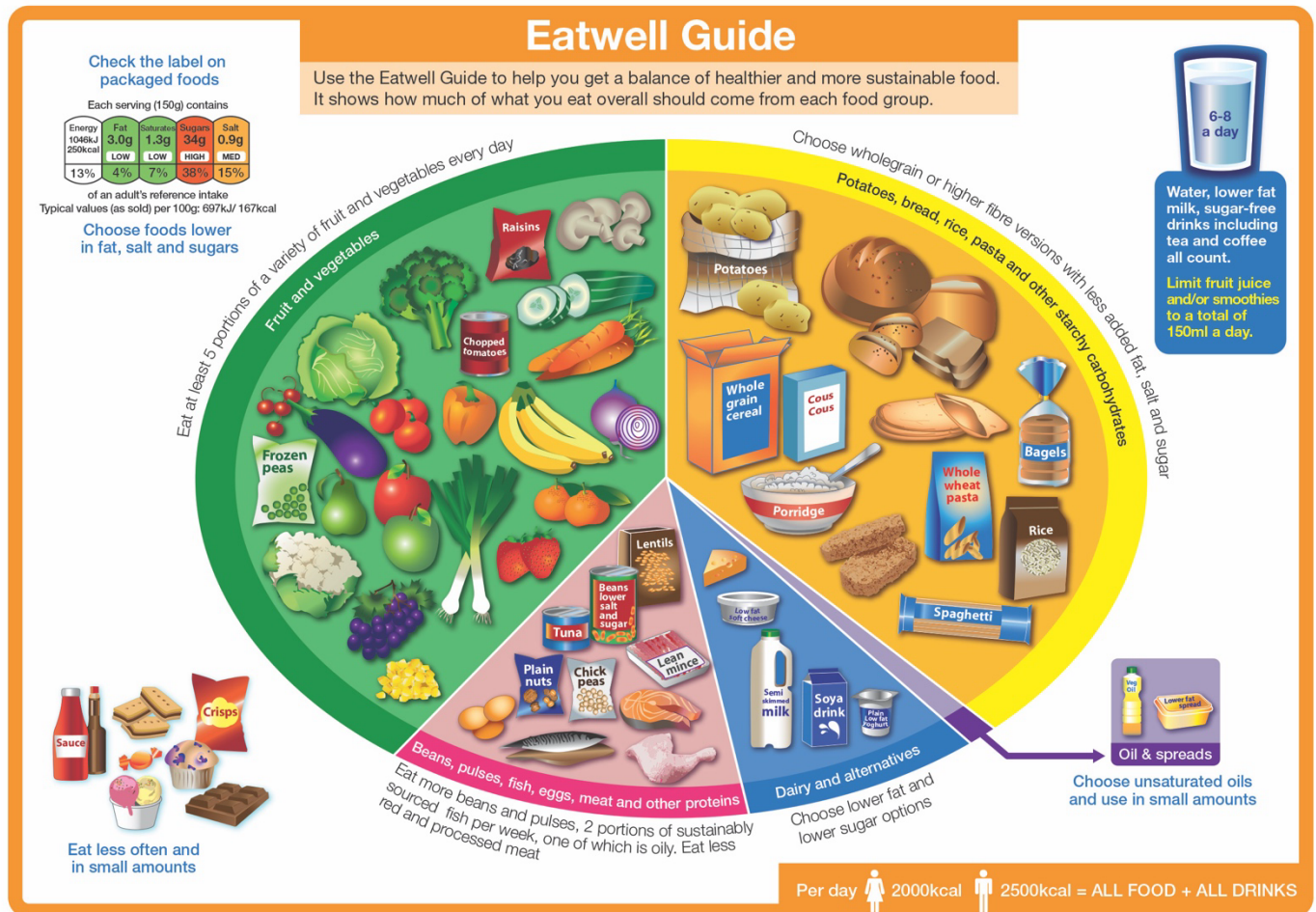
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**This information should only be used with support from your
paediatric dietitian**

Healthy Eating

There is no special diet for people with diabetes. It is just healthy balanced eating, that should be followed by the whole family!



It is important that you:

- Have regular meals each day including a source of protein (meat, fish, eggs, pulses), carbohydrates (pasta, bread, rice, potatoes) and vegetables with each meal
- Eat at least 5 portions of a variety of fruit and vegetables a day
- Include dairy or dairy alternatives. Milk, cheese, yoghurt and calcium enriched dairy-free alternatives are important source of calcium, which helps keep your bones strong. This is particularly important in your childhood and adolescence as the bones are growing rapidly. You should generally be aiming for 3-4 calcium servings per day.
- Vitamin D helps the absorption of calcium from foods. All children should take a daily multivitamin containing vitamin D until the age of 5 years. After this age a multivitamin containing 10µg vitamin D should still be considered, especially during autumn and winter.
- Limit intake of foods high in saturated fat and salt (such as crisps, biscuits, processed meats) – eating freshly prepared foods helps with this
- Drink plenty of fluids – choose water or no added sugar drinks

What are carbohydrates?

Carbohydrate is a nutrient and source of energy found in foods. Children need carbohydrates to stay alert and active throughout the day. Carbohydrates should make up 40-50% of a child's energy intake every day.

Complex/starchy carbohydrates are longer chains of glucose (sugar) molecules so cause a steady rise in blood glucose. Sugary simple carbohydrates cause blood glucose to rise quickly.

Natural sugars are also found in milk and yogurt (lactose) and fruits (fructose).

Carbohydrates are broken down into glucose, so will have the biggest effect on blood glucose. The table below gives an approximate guide to average daily requirement of carbohydrates. This is a guide only and will vary depending on size and activity levels. If you or your child's carbohydrate intake is significantly above/below these values, you can discuss this with the dietitian.

Age	Average carbohydrate requirement per day	
	Boys	Girls
2 - 4 years	100 – 175g	90 – 160g
5 – 7 years	150 – 200g	140 – 190g
8 – 10 years	175 – 250g	160 – 240g
11 – 13 years	210 – 300g	200 – 280g
14 – 16 years	260 – 370g	230 – 300g

Carbohydrate counting

In a person without diabetes, their pancreas will release the right amount of insulin to deal with the increase in blood glucose levels caused by eating carbohydrate.

If you have diabetes, you need to inject the right amount of insulin for the amount of carbohydrate eaten. This is known as Carbohydrate Counting. It helps give you greater variety and flexibility within your diet.

The amount of insulin is calculated using your insulin to carbohydrate ratio. This varies between people and can be affected by how long you have diabetes, your weight, age and how much exercise you do. Some people have different insulin to carbohydrate ratios for different meals throughout the day. Your diabetes team will help you work out your insulin to carbohydrate ratio.

Where do you find carbohydrates?

Added sugars	Natural sugars		Starches
• Ordinary fizzy drinks and squashes (does not include sugar free or no-added sugar) • Sugary breakfast cereals • Sweets and chocolates • Honey, jam and marmalades • Sweetened fruit juice • Sweet puddings and cakes • Sauces with added sugars (e.g. ketchup, BBQ sauce) • Milkshakes • Ice cream	Fructose (fruit sugar) • Fresh fruit • Frozen, tinned or dried fruit • Fresh fruit juice or smoothies	Lactose (milk sugar) • Milk • Yogurts • Milk-based puddings	• Potatoes/chips • Rice • Pasta • Noodles • Bread/wraps/chapatti • Couscous/quinoa/bulgar wheat • Non-sugary breakfast cereals and oats (inc. oat milk) • All flour products: pizza, foods containing pastry • Batters and breadcrumb coatings • Grains added to sausages • Pulse vegetables (baked beans, other beans, peas, mushy peas, chickpeas, dahl, lentils) • Sweetcorn • Sweet potatoes, yams, cassava, plantain, squashes, parsnips

Some foods are naturally carbohydrate-free or very low in carbohydrate and so don't need to be counted. This includes:

- **Protein** - meat, fish, eggs, nuts and cheese, unless they are made with breadcrumbs or coated in pastry, batter or a sweet sauce/coating
- **Fats and oils** - such as butter, margarine, cooking oils, olive oil, mayonnaise and unsweetened cream
- **Most vegetables & salad** - see table above for exceptions
- Water, 'no added sugar' squash and 'diet' drinks

Using food labels

- Packaged foods have their ingredients lists in order of amount. The first ingredient will be present in the highest amount, and the last ingredient may only be present in very small quantities
- All food labels have nutritional information for the main nutrients including energy (kcal/kj), protein, carbohydrate and fat. This is usually given per 100g and sometimes per portion
 - You should always use the total carbohydrate, not “of which sugars”
- **Per portion** figure can work well for some foods such as biscuits, bars or yogurts where we tend to eat a suggested portion size
- For foods such as cereal, rice and pasta, a portion size is not as clear, and you may have to weigh your portion and calculate the carbohydrate content of your portion using per 100g
 1. Weigh your portion
 2. Check the label for carbohydrate per 100g (check if label states cooked or uncooked)
 3. **Total carbohydrate = Carbohydrate per 100g ÷ 100 × the weight of your portion**

Using books and apps

Carbs & Cals © is available as a book or app, it is a visual guide to carbohydrate counting, containing pictures of many different foods, in various portion sizes, alongside their carbohydrate content.

It is recommended that you weigh your portions of foods such as cereals, rice, potatoes and pasta and compare this to the portions in the book for increased accuracy.

Your diabetes team can suggest further mobile apps to help with carbohydrate counting.

Recipes

To work out the carbohydrate in home-made recipes

1. Calculate the carbohydrate for each ingredient in the recipe
2. Add all the ingredients together. This gives you the total carbohydrate for the whole recipe
3. Divide this by the total number of portions the recipe makes, to give carbohydrate per portion

Handy measures guide

Weighing foods is the most accurate way of carbohydrate counting, however if on occasion you do not have access to your scales, our handy measures guide can support you with checking these carbohydrate values.

Breads	Grams of carbohydrate
1 medium slice bread	15
1 thick slice bread	20
1 mini wrap	14
1 large wrap	35
1 Naan bread (60g)	30
Yorkshire pudding (x2 small)	10

Potatoes	Grams of carbohydrate
1 scoop (golf-ball sized) mashed potato	10
1 egg-sized potato (boiled or roasted)	10
Potato wedges (5 wedges)	10
5 chips	10
10 french fries	10
2 potato smiles	10

Pasta, noodles and rice	Grams of carbohydrate
1 tablespoon cooked pasta	10
1 tablespoon cooked egg noodles	15
1 tablespoon cooked rice	10

Milk and milk products	Grams of carbohydrate
100mls milk (all types)	5
1 x 125g pot fruit yogurt	15
1 x 125g pot natural yogurt	10
1 x ladle custard	10
1 standard scoop vanilla ice cream	10

Fruit	Grams of carbohydrate
1 small fun size apple	10
1 medium piece of fresh fruit e.g. medium apple, orange, peach or pear	15
1 small banana	17
2 satsumas, clementines tangerines, kiwi fruit	15
1 small carton (200mls) unsweetened fresh fruit juice	20

Biscuits and Cakes	Grams of carbohydrate
1 digestive or oat-based biscuit	10
2 small plain or semi-sweet type biscuits (e.g. Rich Tea)	10
1 cream filled biscuit e.g. Custard Cream or Bourbon	8
1 small chocolate biscuit e.g. 2 finger Kit Kat	12

Eating out

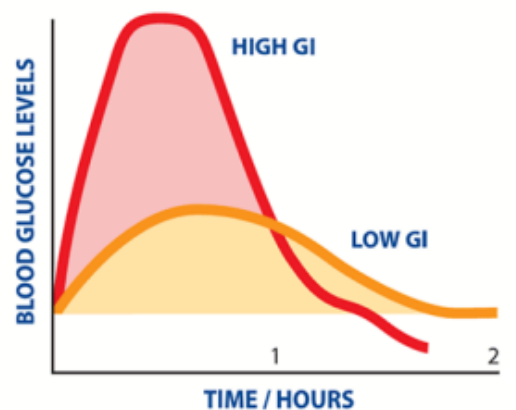
- Whether you're grabbing lunch on the go, enjoying a Friday night takeaway or celebrating a special occasion at a restaurant, diabetes should not be a barrier to this
- Some restaurants have the carbohydrate values of their meals available online or on their app
- The Carbs and Cals book also has details of the carbohydrate values of different takeaway foods such as pizzas, fish and chips, Indian and Chinese meals
- A lot of takeaway meals or meals served at restaurants contain a lot of fat which lowers the glycaemic index of the meal. This means that the glucose may be released from the meal over a longer period of time, which can in some cases cause a spike in blood glucose levels up to 6 hours after the meal. If you find this happens, please speak with one of your diabetes dietitians who can help manage this

Glycaemic index

- Glycaemic Index (GI) measures the impact of carbohydrate foods on blood glucose levels
- High GI foods are digested quickly and cause blood glucose to increase quickly
- Low GI foods are digested more slowly and make blood glucose rise more slowly
- GI is influenced by a number of factors. Fat, protein and fibre will slow the digestion of food, so glucose is released more slowly. GI is also influenced by the type of starch and processing/cooking methods. For example, pasta has a lower GI than rice due to the chemical structure of the starch and jumbo oats have a lower GI than rolled oats
- Insulin cannot work quickly enough for high GI foods, so these are best avoided or paired with low GI foods to reduce the overall GI of the meal
- Choosing low GI foods can help keep your glucose stable but GI does not define how healthy a food is. Some foods such as takeaways and pizza are not the healthiest choice but are low GI
- Try to follow a healthy balanced diet and include some low GI foods with each meal

Tips to lower the GI of meals:

- Add fruit and yogurt to breakfast
- Swap to wholegrain or sourdough bread
- Add egg, beans or peanut butter to toast
- Swap baked potato/chips for sweet/new potato
- Include vegetables with all meals e.g. vegetable sticks in lunch boxes
- Add beans and pulses to stews/casseroles



The amount of carbohydrate in the reference and test food must be the same.

Graph from: University of Sydney www.glycemicindex.com

	Low GI	Medium GI	High GI
Cereal	Wholegrain e.g. All Bran, Clusters, Ready Brek, Oatibix, Porridge	Fruit n Fibre, Muesli, Special K, Puffed wheat, granola	Highly processed cereals e.g. cornflakes, Cheerios, Cocopops, Rice Krispies, Weetabix
Bread	Sourdough, pumpernickel, chapatti	Granary bread, pitta bread, naan, malt loaf, currant bread, rye crispbread, tortilla wrap	White, brown or wholemeal bread, baguette, soda bread, ciabatta, bagel, breadsticks
Potatoes, rice, pasta. Noodles and grains	Basmati rice, brown rice, wild rice, pasta, spaghetti, noodles, buckwheat quinoa	New potatoes, sweet potatoes, savoury rice, egg-fried rice, risotto rice (boiled), egg noodles, couscous	Bakes/mashed potatoes, oven chips, croquettes, potato waffles, instant mash, gluten free pasta
Vegetables and pulses	Carrots, cabbage, cauliflower, green vegetables, celery, tomatoes, peppers, peas, sweetcorn, beans, chickpeas, lentils	Beetroot, pumpkin, turnip	Parsnip, swede
Fruit	Apples, banana, grapefruit, orange, clementines, pears, berries, cherries, grapes, plums, kiwi, peaches, mango	Apricots, sultanas, raisins, dried fruit, pineapple, dates, fig	Melon, blackcurrant, lychee
Dairy	Milk, yogurt, cheese, cream, cream cheese, soya milk, soya yogurt, custard, sorbet	Ice cream	Rice milk
Snacks and confectionary	Sponge cake, tortilla chips, potato crisps, vegetable crisps, chocolate, hummus, sour cream dip, salsa	Digestives, rich tea, shortbread, fruitcake, oat biscuits, crumpet, cookies, croissants, pancakes	Wholemeal crackers, scones, Ryvita, cereal bars, popcorn, pretzels, fudge, Turkish delight, marshmallows

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Accessibility

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