

# Healthy Eating and Carbohydrate Counting for Children with Diabetes



## What can I expect from the Dietitians?

### In hospital: (at diagnosis)

- We will meet you and provide nutrition advice based on your needs and answer any questions you may have. We will teach you how to carbohydrate (carb) count during this time.

### At home:

- If we have not seen you in hospital, we will aim to see you at your home soon after you are discharged from hospital to help support you.
- We are usually at the diabetes clinic appointments that you will be invited to every 3 months.
- Once a year you will be offered an extra appointment to discuss any topics such as exercise, nutrients for growing and carb counting updates.
- If you need extra support or training, we can arrange this at home, at school/nursery, during clinic or over the telephone.
- As a team, we provide group education and events that you will be invited to.

### The Dietitian can support you with:

- Healthy eating and how to eat a balanced diet.
- Any concerns about weight.
- Carb counting - if you are new to it, would like to re-cap or would like to become more independent, such as when starting high school/school trips.
- School - particularly carb counting for school meals.
- Understanding the glycaemic index and other dietary factors that affect the glycaemic response to foods.
- Using advanced insulin pump bolus techniques.
- Special dietary needs, such as gluten free diets for coeliac disease.
- Managing exercise and physical activity.

## Contact details

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Tel: 07824 596904



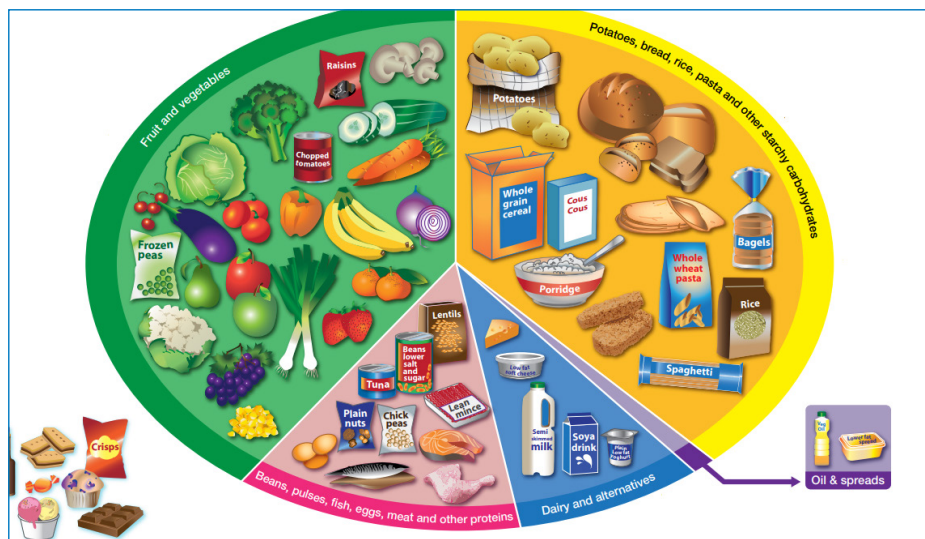
## What can children with type 1 diabetes (T1D) eat?

Children and young people can eat the same foods as everyone else. We know that eating less fat, less added sugar and more wholegrain foods will help manage blood glucose levels, as well as keeping us healthier for the future.

Choosing healthy balanced meals, spread out during the day over 3-4 meals will help your energy levels and manage your blood glucose control. These meals can be enjoyed by all your family and friends and should provide all the nutrients you need to grow and develop, be a healthy weight and keep your heart healthy. There are no foods the family must avoid completely. Try to make healthy choices most of the time.

## What is healthy eating?

The Eatwell Guide below represents a balanced diet, and it is appropriate for children over 5 years, adolescents and adults. Younger children should also be encouraged to eat family foods and aim to be eating the proportions shown on the Eatwell Guide by the age of 5.

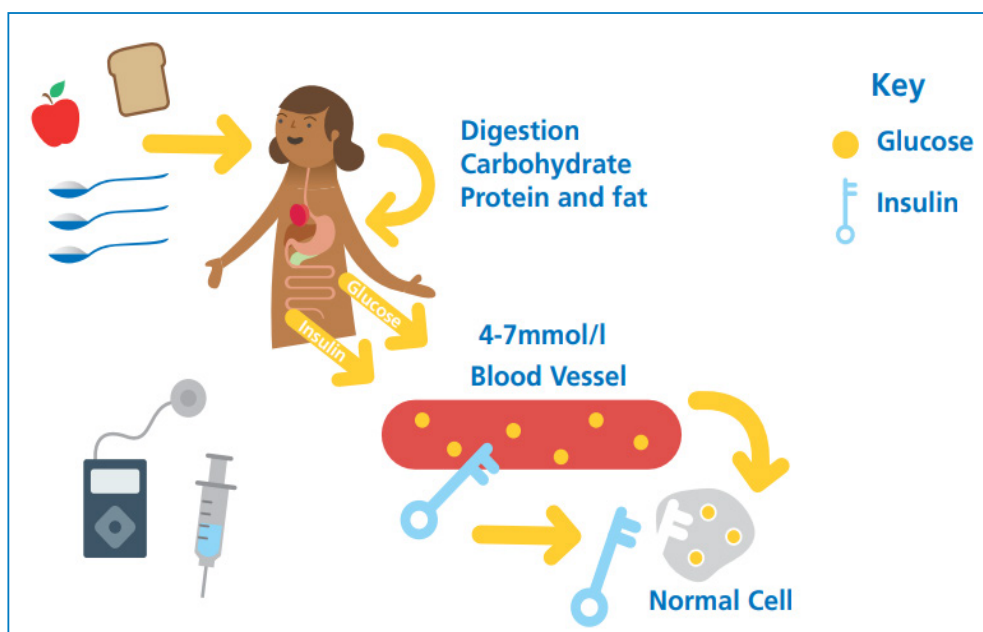


## Making healthy food choices:

- Eat regular meals. Aim for 3 meals a day that are balanced in high fibre starchy carbohydrates, proteins, fats, including vegetables/fruit
- Start the day with breakfast. Choosing higher fibre options and including protein for example a boiled egg, baked beans or yoghurt will also help manage blood glucose levels.
- Try and have at least a 1.5-2-hour gap between meals and snacks. Only snack between meals if you are hungry and stick to small snack items (no more than 10g carbohydrate).
- The best option for fluid is water. If you choose to have no added sugar drinks, check the label as these may contain carbs, make up as per the instructions.
- Limit sweets to mealtimes and try not to include them every day of the week.
- Try to avoid distractions at mealtimes and if possible, eat as a family.
- Try not to reward good eating behaviours with food. Instead use other things enjoyed e.g., magazine, trip, stickers.
- Parents/carers should avoid forcing a child to clear their plate. If a meal is regularly not finished, then plate up smaller portions in future.

## What are carbohydrates and why are they important?

- All the food you eat is made up of carbohydrate, protein and fat or a mixture of these.
- Carbohydrate is the main nutrient in food that provides energy for the body so you can breathe, walk, run, play football and dance.
- Carbohydrate is broken down into glucose by the digestive system and enters the blood stream.
- Glucose is needed in the body's cells (muscles, organs) to make energy, but glucose cannot be transported from the blood without insulin, the key!
- Insulin is the key that opens the lock on the cell door to allow glucose to move from the blood stream into the cell to produce energy.
- Insulin also allows the body to store glucose in the liver and the muscles if it is not needed for energy.



## Matching insulin to carbohydrate

- The more carbohydrate you eat the more insulin (keys) you need to open the cells.
- Counting carbohydrate allows you to match the insulin to the carbohydrate you eat.
- Matching insulin to carbohydrate will allow you to keep blood glucose between 4-7mmol/l

**DigiBete** DigiBete have videos on carb counting you can watch on their app and webpage  
<https://www.digibete.org/carbohydrate-counting/>



## How much carbohydrate do we need?

Everybody needs carbohydrate for energy it's advised that you have 40% to 55% of energy from carbohydrate.

| Age (years) | Average daily carbohydrate requirement in grams |            |
|-------------|-------------------------------------------------|------------|
|             | Boys                                            | Girls      |
| 1 - 3       | 70 – 145g                                       | 70 – 130g  |
| 4 – 6       | 140 – 195g                                      | 130 – 185g |
| 7 – 10      | 165 – 250g                                      | 150 – 240g |
| 11 – 14     | 215 – 330g                                      | 200 – 290g |
| 15 – 18     | 280 – 400g                                      | 240 – 310g |

To provide your body with a regular supply of energy it is best to spread carbohydrate as equally as possible throughout the day. This may not be possible every day but a structure to your normal eating pattern would help your energy levels and blood glucose control.

Your average daily carbohydrate requirement calculated with your Dietitian is:

Daily carbohydrate:  g to  g

Main meals carbohydrate:  g to  g

## Getting the balance right

| Food Group                                                       | Foods included                                                                                                                                                                     | Main nutrients                                               | Recommended frequency                                                                                                                                                                            |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Starchy carbohydrates</b><br>eg. Potatoes, bread, rice, pasta | Bread, chapatti, breakfast cereals, rice, couscous, pasta, potatoes, and foods made with flour such as pizza bases, buns, pancakes                                                 | Carbohydrate<br>B vitamins<br>Fibre                          | Base meals on these foods                                                                                                                                                                        |
| <b>Fruit and vegetables</b>                                      | Fresh, frozen, tinned and dried fruits and vegetables, unsweetened fruit juice                                                                                                     | Vitamins and minerals<br>Fibre                               | Eat at least 5 portions of a variety of these a day<br><b>Note: Fruit juice can be counted as a portion once per day - although it is high in sugar can be difficult to manage with diabetes</b> |
| <b>Dairy and alternatives</b>                                    | Breast milk, formula milk, cow's milk, yoghurts, cheese, calcium enriched soya, oat, nut and rice milks, tofu<br><b>Note: Rice milk is not suitable for children under 5 years</b> | Calcium<br>Protein                                           | Include some of these a day<br><b>Note: Semi-skimmed milk can be used after 2 years</b>                                                                                                          |
| <b>Beans, pulses, fish, egg, meat and other proteins</b>         | Pulses, dhal, nuts, seeds, meat, fish, eggs, Quorn                                                                                                                                 | Protein<br>Iron and other minerals<br>Omega-3 from oily fish | Aim to eat 2 servings of protein rich foods each day<br>Fish should ideally be offered twice per week with at least one serving should be oily fish                                              |
| <b>Oils and Spreads</b>                                          | Butter, margarines, cooking oils                                                                                                                                                   | Vitamin D & E<br>Omega-3 fatty acids                         | Use these sparingly.<br><b>Note: Unsaturated fats are healthier fats and include vegetable, rapeseed, olive and sunflower oils</b>                                                               |
| <b>Fluid</b>                                                     | All drinks including water, milk and milk substitutes, squashes, juices and hot drinks                                                                                             | Water                                                        | 6-8 drinks per day and more in hot weather or after physical activity<br><b>Sugary drinks should be discouraged</b>                                                                              |

**Foods high in fat, salt and sugar** such as cream, salad oils, mayonnaise, chocolate, confectionary, cakes, biscuits, jam, honey, sugar, syrup, ice-cream, crisps and other high fat savoury snacks are not essential and so should be eaten less often and in small amounts.

## Meal ideas

### Breakfast Ideas

Wholegrain cereal with semi skimmed milk  
e.g., Weetabix, Branflakes or Shredded Wheat

-

Porridge with fruit/nuts/seeds

-

Fresh fruit or fruit tinned in juice With Greek yogurt

-

Toast (granary, multigrain or wholemeal) with egg, peanut butter, cheese & tomato

### Light Meal

Soup with bread

-

Baked beans or eggs on toast

-

Sandwich - try lean meat, tinned fish, humous, peanut butter, cheese with salad as a filling

-

Toasted sandwich made with cheese & tomato

-

Jacket potato with tuna/beans or cheese served with a salad

### Main Meal Ideas

Meat, chicken, fish, quorn, soya, potatoes/rice & vegetables

-

Pasta with a tomato based Sauce/pesto and vegetables with chicken/beans/lentils

-

Omelette with bread and salad

-

Casseroles/Stew

- try adding beans or pearl barley

-

Stir fried chicken/tofu/quorn, vegetables & noodles or boiled rice

### Dessert & snack ideas

Yogurt & fruit

Sugar free jelly, mousse, or whips

Milky puddings e.g., custard, rice pudding

Fresh fruit

Crackers/ breadsticks with cheese spread/ salsa/ hummus

### Low carbohydrate snacks

Vegetable sticks with dips, a handful of berries, cheese, sugar free lollies, cottage cheese, hard cheeses, sugar free jelly, handful of nuts, boiled egg

## Recipe ideas

<https://www.nhs.uk/healthier-families/recipes/>

<https://www.diabetes.org.uk/Guide-to-diabetes/Recipes/>

[www.digibete.org/frances-kitchen/](http://www.digibete.org/frances-kitchen/)

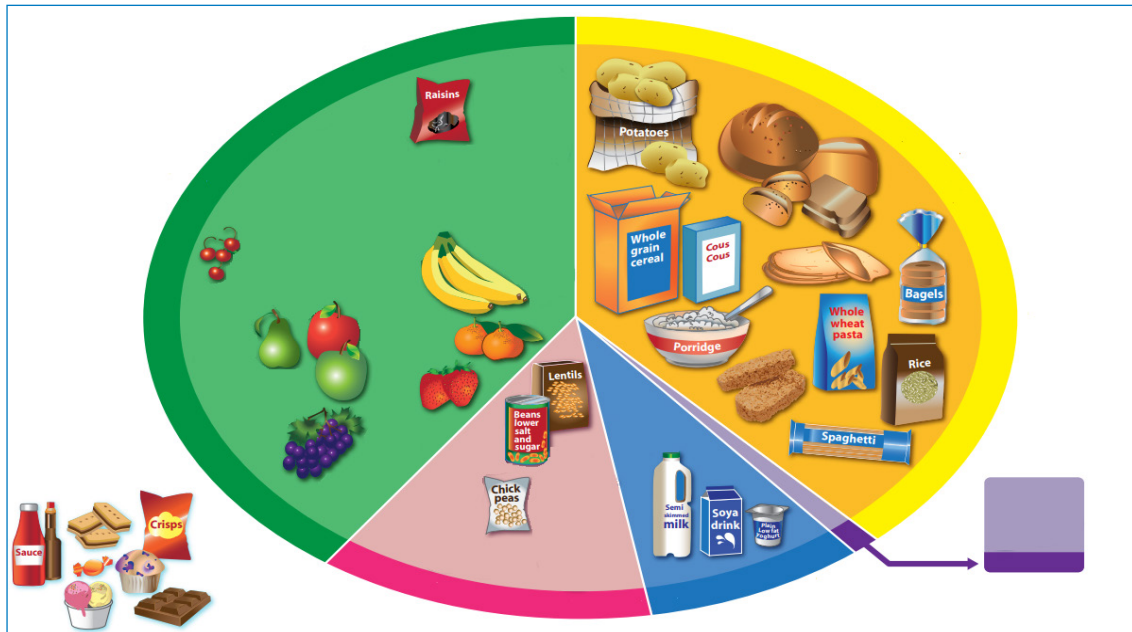
[www.myfussy eater.com](http://www.myfussy eater.com)

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

[www.endchildfoodpoverty.org/full-time-meals](http://www.endchildfoodpoverty.org/full-time-meals)

## Types of carbohydrates

The picture below shows examples of foods from each group that contain carbohydrate.



Carbohydrate foods are foods that contain either starches, added sugars (sucrose, maltose, and glucose for example) or natural sugars (fructose and lactose found in fruit and milk).

### Starch

Starchy carbohydrates found in foods like:

- potatoes
- rice
- pasta
- noodles
- bread
- breakfast cereals
- oats
- couscous
- lentils
- beans
- pulses
- starchy vegetables such as peas, sweetcorn, parsnips
- crackers
- anything made with flour such as pizza, pastry, biscuits and cakes

### Try to:

- get most of your carbohydrate from starchy not sugary food.
- have starchy foods at each meal, if possible, choose wholegrain or wholemeal varieties.
- limit starchy foods that are high in fat and/or sugar such as crisps, pastry, cakes, and biscuits.

## Fructose

This is the carbohydrate in fruit. Fruit also contains fibre and vitamins which are important for everyone and should be included in your diet every day with meals or as a snack.



## Lactose

This is the carbohydrate in milk. Milk is very important for children as it provides energy plus protein and calcium to help you grow strong and healthy. Try to have milk and yoghurt every day. If you have dairy alternatives, aim to choose milks and yogurts fortified with calcium; these would not have lactose but need labels reading to check for the carb content.



## Added sugar

Sugary food and drinks contain added sugars. Added sugars include sucrose or table sugar, honey, glucose, dextrose, and high-fructose corn syrup. Some food and drinks that contain a lot of added sugar will raise your blood glucose quickly. You don't need to avoid added sugar completely, but limit sugary drinks, very high-sugar sweets, and other sweet foods like biscuits, chocolate, cakes, and sweet pastries. Reducing sugar and sugary foods helps keep you healthy by reducing the risk of excess weight gain, tooth decay, and helps to control blood glucose levels.



## Low-carbohydrate food

Foods with little or no carbohydrate should not affect your blood glucose.

The list below provides examples.

- Vegetables except for starchy ones such as peas and sweetcorn
- Olives
- Seeds, for example sunflower or pumpkin
- Plain nuts
- Sugar-free jelly
- Sugar-free ice-pop

## Protein & fat foods (No carbohydrate)

- Cheese
- Eggs
- Fresh, unprocessed meat including poultry, pork, and beef.
- Fish
- Butter, margarine, ghee, oil, mayonnaise, cream

## High fibre foods

Foods such as:

- Vegetables
- Beans, pulses and lentils
- Tomatoes
- Nuts and seeds
- soya
- Cherries
- Grapefruit
- Hummus

Although these foods contain some carbohydrates, they are absorbed very slowly and may not need insulin unless eaten in large quantities. With experience you will find out what works best of you.

| Foods we count/ Need insulin      |                                                              |               |      |                          |                                            |
|-----------------------------------|--------------------------------------------------------------|---------------|------|--------------------------|--------------------------------------------|
| Starchy foods                     | Fruit and vegetables                                         | Dairy         | Fats | Protein                  | Foods we should eat less                   |
| Potatoes                          | Peas, sweet corn                                             | Milk          |      | Lentils (Dhal)           | All foods containing added sugar (sucrose) |
| Rice                              |                                                              |               |      |                          |                                            |
| Pasta                             | All fruit: fresh or frozen                                   | Milkshakes    |      | Chickpeas (Chana)        | Ordinary fizzy drinks, squashes            |
| Bread                             |                                                              | Ice-cream     |      | Beans, pulses            | Sugary cereals                             |
| Breakfast cereals and oats        | Tinned fruit (be aware of whether this is in juice or syrup) | Yogurts       |      | Processed meat and fish: | Sweets and chocolates                      |
| Flour products: Pizza, pastry     |                                                              | Fromage frais |      | Sausages                 | Honey, jam and marmalades                  |
| Baked foods                       | Dried fruit                                                  | Rasmali       |      | Fish fingers             | Sweetened fruit juice                      |
| Plantain, yam, fufu cassava, Gari |                                                              |               |      | Fried breaded chicken    | Asian Sweets; Burfi, Gulab Jaman, Jellabi  |
| Injera, Teff                      |                                                              |               |      | Battered / breaded fish  |                                            |

| Foods we don't count/ Do not need insulin |                                                      |        |              |             |                          |
|-------------------------------------------|------------------------------------------------------|--------|--------------|-------------|--------------------------|
| Starchy foods                             | Fruit and vegetables                                 | Dairy  | Fats         | Protein     | Foods we should eat less |
|                                           | Salad items e.g. lettuce, tomato, peppers, cucumber. | Cheese | Margarine    | Plain meats | Sugar free Jelly         |
|                                           |                                                      | Cream  | butter       | fish        | Sugar free fizzy drinks  |
|                                           | Most Vegetables - fresh or frozen                    |        | olive oil    | eggs        | Sugar free squash        |
|                                           |                                                      |        | Rapeseed oil | nuts        |                          |

## How to carbohydrate count

### Step 1: Identify the carbohydrate in your meal to count

### Step 2: What is my portion size?

For each carbohydrate containing food you eat you need to be able to work out your portion size. For some foods/meals this may be quite easy for others you may need to weigh your food or use measuring/portion cups

Look at the 2 examples of cereal and milk for breakfast.

#### Breakfast 1

2 weetabix, with milk and a banana



#### Breakfast 2

A bowl of cornflakes and milk



You will need to weigh or measure the cornflakes, banana and the milk to know your portion size. The Weetabix is more straightforward, as the packet will describe a portion as the number of Weetabix.

### Step 3: How much carbohydrates in my portion?

- Carbs and Cals book or app
- Nutracheck app
- MyFitnessPal app
- Food weights
- Information from restaurants, food outlet websites
- Searching on the internet
- Food labels



For each carbohydrate containing food you eat, you will need to work out your portion size. For some foods/meals this may be quite easy, but for others you may need to weigh your food or use measuring/portion cups.

Reading food labels

Most packaged food has nutritional information on the back or side. This shows the main nutrients, including energy (calories), protein, carbohydrate, and fat. This is usually per 100g and sometimes per portion/serving.

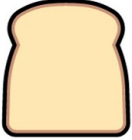
Use the "carbohydrate" amount (not of sugars)

Check if it shows per portion. Is this the portion you will eat?

| Nutrition          |                  |                                     |       |                          |
|--------------------|------------------|-------------------------------------|-------|--------------------------|
| Typical values     | 100g contains    | Each slice (typically 44g) contains | % RI* | RI* for an average adult |
| Energy             | 985kJ<br>235kcal | 435kJ<br>105kcal                    |       | 8400kJ<br>2000kcal       |
| Fat                | 1.5g             | 0.7g                                | 1%    | 70g                      |
| of which saturates | 0.3g             | 0.1g                                | 1%    | 20g                      |
| Carbohydrate       | 45.5g            | 20.0g                               |       |                          |
| of which sugars    | 3.8g             | 1.7g                                | 2%    | 90g                      |
| Fibre              | 2.8g             | 1.2g                                |       |                          |
| Protein            | 7.7g             | 3.4g                                |       |                          |
| Salt               | 1.0g             | 0.4g                                | 7%    | 6g                       |

This pack contains 16 servings  
\*Reference intake of an average adult (8400kJ / 2000kcal)

If it is foods such as rice or pasta check, it is **dry** or **cooked** weight?



Have a go

Using this label, how many carbs are in the packet of crisps?



| Typical Values     | Per 25g pack | Per 100g |
|--------------------|--------------|----------|
| Energy             | 549kJ        | 2194kJ   |
| -                  | 132kcal      | 526kcal  |
| Fat                | 8.0g         | 31.9g    |
| Of which saturates | 0.7g         | 2.6g     |
| Carbohydrates      | 12.9g        | 51.5g    |
| Of which sugars    | 0.1g         | 0.4g     |
| Fibre              | 1.1g         | 4.3g     |
| Protein            | 1.5g         | 6.1g     |
| Salt               | 0.35g        | 1.4g     |

Using this label, you decide you only want 3 fish fingers. How many carbs do they have?



| Typical Values     | Per sold 100g provides: | Per 4 fish fingers (112g) oven baked provides: |
|--------------------|-------------------------|------------------------------------------------|
| Energy             | 916kJ                   | 1024kJ                                         |
| -                  | 218kcal                 | 244kcal                                        |
| Fat                | 9.4g                    | 10.0g                                          |
| Of which saturates | 0.8g                    | 0.8g                                           |
| Carbohydrates      | 21.0g                   | 24.0g                                          |
| Of which sugars    | <0.5g                   | <0.5g                                          |
| Fibre              | 0.9g                    | 1.0g                                           |
| Protein            | 12.0g                   | 14.0g                                          |
| Salt               | 0.88g                   | 0.99g                                          |

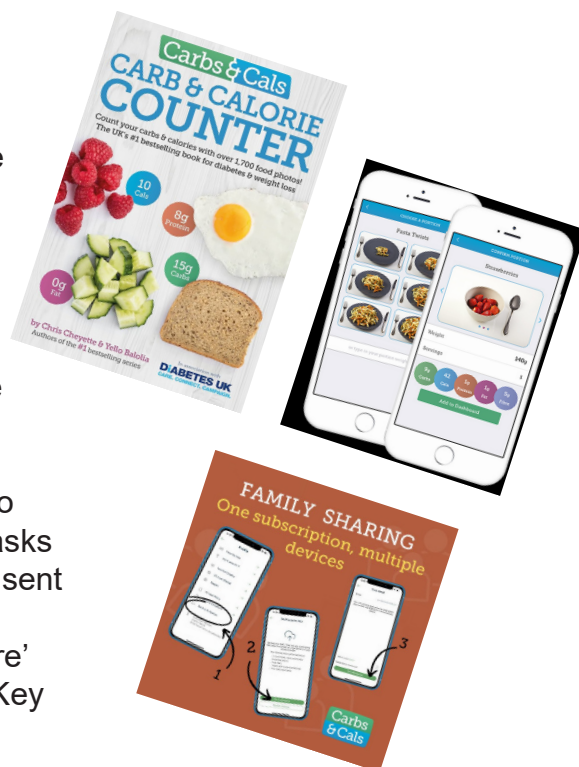
## Carbohydrate counting resources

### Carbs and Cals app or book

Carbs and Cals is a visual resource to help you carbohydrate count your foods using photos of different portions. There is a book as well as an app.

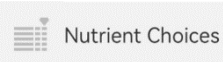
There is a free version of this app however the full database of foods is only available on the subscription. This is £6.99 per month or £35.99 for a year and this can be used on more than one phone for this one price.

You can share your subscription with your family by going into 'profile', 'Backup & Restore', then 'OK, start backup', it then asks for your email then click 'Send Backup Key'. The Key is then sent to your email, and this can be entered into multiple phones. To do this on a family members phone go to 'Backup & restore' again but this time click 'Restore a backup' then the backup Key can be entered here, then finally click 'Restore Backup'.



**Nutracheck** is another app that can be used for carb counting. Originally designed for healthy eating the app has carb information for a wide range of foods. It is a free app to search foods as well as use the weight calculator.

If you want to have more access to features such as saving more than 5 foods a day in your diary, as well as creating meals and recipes then it is £6.99 a month or £27.99 for a year. The same account can be used on multiple phones by logging in with the same details.

On Nutracheck you can change the setting to carbs by clicking the  then  Diary Preferences then  then scroll until you reach carb 

### Weighing food

It is important to weigh your food when you count carbohydrates. Foods that are good to weigh include pasta, rice, potatoes (roast, mashed, chips, jacket), couscous, noodles, breakfast cereals, homemade recipes or fruits.

Use nutritional labels and digital weighing scales to calculate the carbs in your portion as below:

**The amount of carbohydrate  
in 100g of food**

**100**

**X Weight of your portion (g)**



Have a go!

Cornflakes cereal



Your portion weighs 45g

| Typical Values     | /100g   | /30g    |
|--------------------|---------|---------|
| Energy             | 1604kJ  | 481kJ   |
| -                  | 378kcal | 113kcal |
| Fat                | 0.9g    | 0.3g    |
| of which saturates | 0.2g    | 0.1g    |
| Carbohydrate       | 84g     | 25g     |
| of which sugars    | 8.0g    | 2.4g    |
| Fibre              | 3.0g    | 0.9g    |
| Protein            | 7.0g    | 2.1g    |
| Salt               | 1.1g    | 0.34g   |

Calculate the carbs in your weighed portion:

Milk



Your portion is 150ml

| Typical Values | Per100ml     |
|----------------|--------------|
| Energy         | 209kJ/50kcal |
| Fat            | 1.8g         |
| Saturates      | 1.1g         |
| Carbohydrate   | 4.8g         |
| Sugars         | 4.8g         |
| Fibre          | 0g           |
| Protein        | 3.6g         |
| Salt           | 0.11g        |

Calculate the carbs in your weighed portion:

Total carbs

Carbohydrate value for cornflakes cereal with milk =

Chips

You weigh your portion of chips, and they are 70g



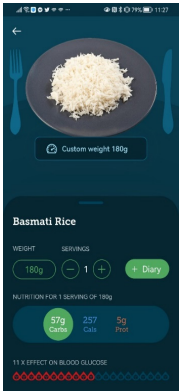
| Typical Values     | Per 25g pack | Per 100g |
|--------------------|--------------|----------|
| Energy             |              |          |
| -                  |              |          |
| Fat                |              |          |
| of which saturates |              |          |
| Carbohydrate       |              | 30       |
| of which sugars    |              |          |
| Fibre              |              |          |
| Protein            |              |          |
| Salt               |              |          |

Calculate the carbs in your weighed portion of chips =

Portion calculator function on Apps

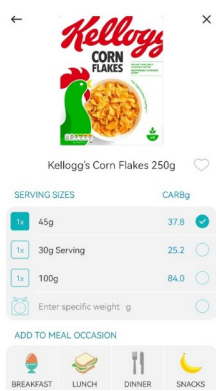
Instead of using a calculation by hand to work out carbohydrate in a portion, you can use apps to do this for you. Apps such as Carbs and Cals, Nutracheck and Myfitness Pal.

Carbs and Cals



Search for food needed then 'enter a custom weight'

Nutracheck



Scan barcode or search for it and then 'enter specific weight'

Standard portion measures:

- Standard measures (portions/cups) can be helpful for speeding up carbohydrate counting of foods you eat regularly.
- Finding an easy measure like a spoon or cup can help to serve the same size portion.
- Weigh the portion of food from your easy measure, calculate the carbs using the above ways and then write down the carbs in the portion of food from the easy measure.
- For example, use an ice cream scoop when serving mash potato (if 60g in weight this would be 10g carbs). Or a cup full of cooked rice (if using a 240ml cup this would be 47g carbs).



This may help on a day-to-day basis.

Recipes

You and your family can still enjoy your favourite recipes. Once worked out, you can save this to use next time.

Tips

- ✓ Use recipe builders on apps such as Carbs and Cals 'create a custom food' and MyFitnessPal 'create a recipe' and Nutracheck 'create meal'
- ✓ By hand using the labels or picture reference books and apps write down the recipe and divide by each portion like the table below

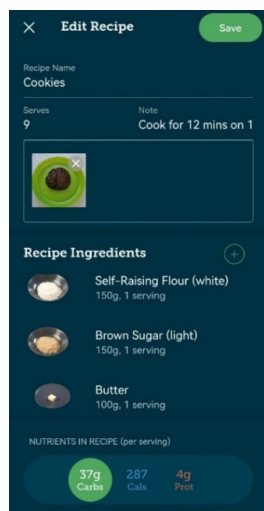
Have a go Scone recipe, to make 8

| Ingredient | Weight of ingredient | Carbs per 100g | Carbs per ingredient |
|------------|----------------------|----------------|----------------------|
| Flour      | 200                  | 78             |                      |
| Margarine  | 50                   |                |                      |
| Sugar      | 50                   | 100            |                      |
| Milk       | 125                  | 5              |                      |
| Egg        | 1 egg                |                |                      |
| Sultanas   | 50                   | 69             |                      |
|            |                      |                | TOTAL                |
|            |                      |                | Per scone            |

## Using Apps to make a recipe:

### Carbs & Cals:

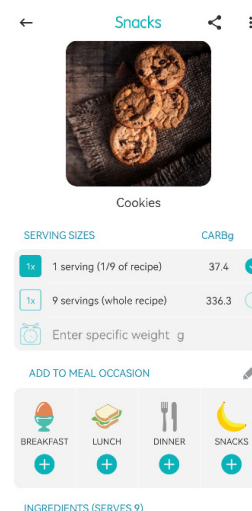
Under 'Explore foods' click 'My Foods, Meals & Recipes' then '+' on the top right corner to create a new recipe, click 'Build a Recipe' and here you can add each ingredient and measurements and it will calculate the carbs in your portion specified.



### Nutracheck:

Selecting 'My Meals' at the bottom, '+ Create' at the top and again add a title and portion and what occasion the recipe/meal is for and on the 'Next' page select the ingredients and portion sizes and 'Save'.

\*paid version only\*



## Other considerations:

### Cooked foods

When you cook raw food for example rice or pasta or potatoes the weight will change. Foods cooked in water usually weigh more after cooking and foods cooked in the oven usually weigh less



When you are cooking for a family, it is more practical to work out the carbohydrate from the food after it has been cooked. Look at picture reference guides to look at carbs in the cooked food when portioned out e.g., cooked pasta and rice. Carbohydrate values for foods can vary by brand, cooking method and time. Always aim to follow cooking instructions.

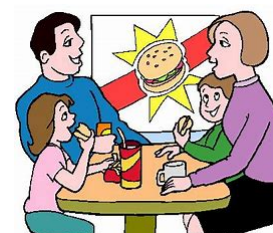


## Eating out

Many large restaurant chains have nutrition information online to help with eating out. Normally searching nutritional information and the restaurant will lead you to the correct page. You will also find some of these in the carb counting books and apps.

When there is no nutritional information available you can use the picture reference guides, e.g., Carbs and Cals app, to visually guesstimate your food and portion.

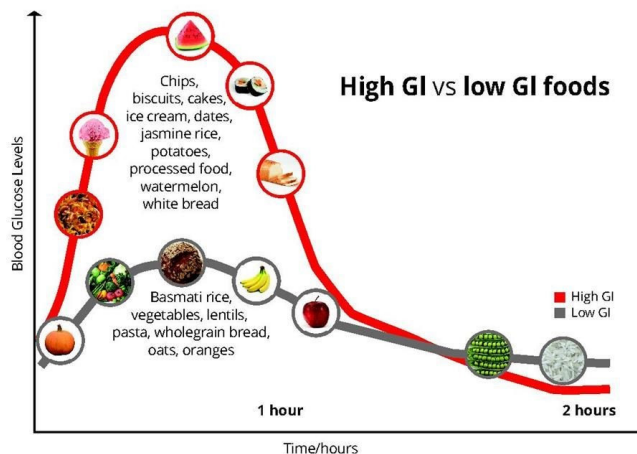
We also know that foods eaten outside of the home often contain more fat and protein and they can have more of an effect on glucose levels. You may find meals out need different amounts of insulin compared to when you eat the same foods at home.



## Glycaemic index (GI)

For most of the foods you eat you will find that the amount of carbohydrate is all you need to work out your insulin doses. We know that the type of carbohydrate and the other foods that you have with a meal can change the amount of insulin you need.

The glycaemic index (GI) tells us how quickly or slowly a food affects the glucose levels. In other words, how quickly the body can breakdown the food to produce glucose. Foods with a very low GI value like beans and pulses may need less insulin than you calculate from the amount of carbohydrate, foods with a very high GI can be difficult to match with insulin as the glucose rises so quickly. It has been shown that eating more wholegrain low fat low GI foods helps give steadier glucose levels in the target range after eating.



High GI are digested and absorbed quickly

Low GI are digested and absorbed slowly

## Mixed meals

Aim for balanced meals as your habit, this is  $\frac{1}{4}$  plate carbohydrate,  $\frac{1}{4}$  plate protein &  $\frac{1}{2}$  plate vegetables/salad.

Mixed meals make it easier to manage your diabetes.

### Example of mixed meals:

#### Breakfasts:

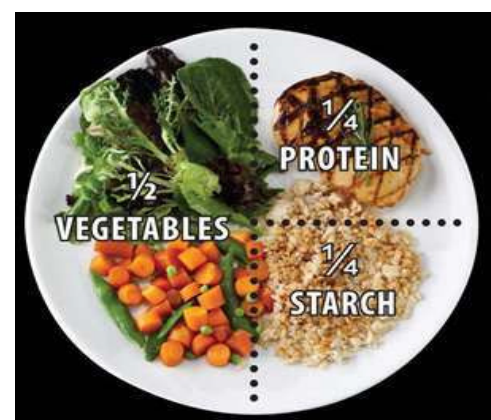
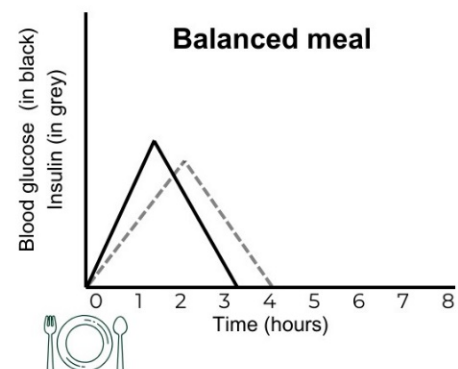
- Porridge with semi or full milk & nuts
- Egg or fish on toast with mushrooms
- Cheese on toast with tomatoes

#### Meals:

- Meat/fish/beans with potatoes & veg
- Jacket potato with cheese & salad
- Rice with curry and salad

#### Snacks:

- Whole fruit with nuts
- Nut butter on toast
- Whole yoghurt with nuts



## High fat and high protein meals

We know that two meals with the same amount of carbohydrate may have a different impact on blood glucose levels. This may depend on a variety of factors such as:

- How quickly the carbohydrate is digested and released (the glycaemic index)
- How much fat and protein is in the meal.

The types of meals that you may find difficult to manage include;

1. Creamy or cheesy pasta dishes
2. Fast food, e.g. pizza, burgers, fries etc.
3. Curries and other Asian meals
4. Pastries
5. Desserts



To manage meals you can adjust:

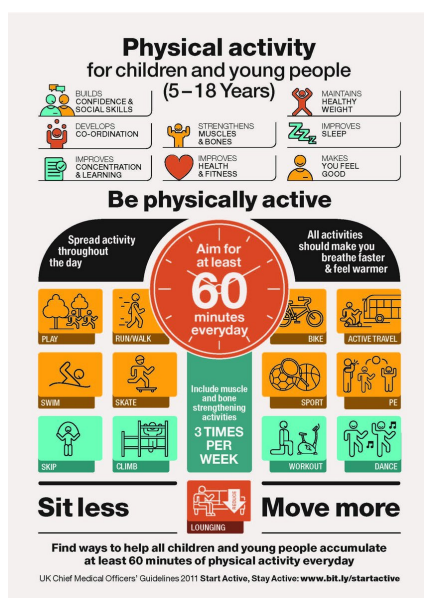
- The type of bolus- on insulin injections give 50% on insulin is given as usual and the other 50% 1 hour after finished eating
- The insulin dose – if the glucose level is high six hours after eating, next time increase meal insulin by 25%

Meals that contain large amounts of protein (25g or more) and/or fat (20g or more) may cause high blood glucose levels 3-5+ hours after eating. High fat and protein meals delay digestion and absorption of carbohydrate and cause some insulin resistance after the meal. Smaller amounts of fat or protein may impact the blood glucose levels of younger children. Use the Carbs & Cals book/app or food labels to identify the fat and protein content of meals. High fat and protein meals may require larger insulin doses.



Watch this Digibete video on managing 'Challenging meals'

## Activity and Lifestyle



Children and young people should follow aim to do at least **60 minutes** of moderate – vigorous activity every day and limit screen/ sedentary time to 2 hours a day.

Being active for at least 10 minutes counts, the 60 minutes does not have to happen all at once.

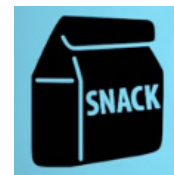
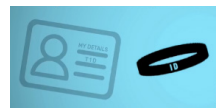
The main fuel for active muscles is glucose. We store glucose in our muscles as something called glycogen. During and after activity we move more glucose into our muscles. After activity we usually need less insulin, so being active every day can help lower insulin requirements and help glucose levels. For example, if you notice that your glucose levels are high after breakfast (this is quite common) you may find a walk after breakfast helps lower your glucose levels – if you can, walk to school/college.

Sometimes when activity is more strenuous it can make managing glucose levels more challenging – we can help you to learn how to manage your glucose levels.

## A guide to exercise and T1D

### Top tips for managing sports and activities.

- 1. Always check your blood glucose level** before exercise – every 30 min – during – and at the end. If you know your blood glucose level is falling, rising or stable then it helps you decide what you need to do, especially to stop a low blood glucose.
- 2. Always carry a drink-** everybody needs to make sure they have enough fluid during the day. If you are being active, then water is the best fluid to take on board. If blood glucose levels are running a bit high, then you are going to need more fluid when you exercise than if your bloods are running okay.
- 3. Wear some ID or carry some ID-** especially if you are out exercising without an adult around. You can put medical ID information on your phone. Be careful and do not exercise alone without any form of ID because accidents can happen.
- 4. Always carry a snack** - have some extra food, you might think you have had enough to eat or drink to keep your BG levels up, but again, you never know what might happen or what might be a bit different. Kit bag snacks are useful just in case, such as dried fruit, pancakes, cereal bars, fruit, cake bars, Jaffa cakes, trail mix.



### What numbers matter?

- **Target range for exercise is 5-10mmol/l**
- In general, aerobic exercise is associated with a drop in glycemia, while anaerobic and mixed forms of exercise can be associated with less of a drop or even a rise in glycemia.
- **What to do if your activity will likely lower your blood glucose**
  - o If blood glucose level is below 7mmol/l – have a 10-15g snack without insulin.
  - o If blood glucose level is below 4mmol/l – treat as a hypo and not to exercise until above 5 mmol/l.

## Snacks for activity

Extra carbohydrate snacks to keep glucose levels up during activity. Snacks before and during exercise (around 10-15g carbs):

- Fruit e.g., banana, pear, apple
- Dried fruit e.g., sultanas, raisins, dried pineapple, or apricot
- Low fat cereal bars e.g., breakfast cereal bars
- Low fat biscuits e.g., Jaffa cakes
- Jelly sweets
- Fruit juice or fruit juice mixed with water.
- Sports drinks
- Sports Gel

## Schools

If you have a school meal, we advise you speak to the school to obtain carbohydrate amounts for school foods and drinks. School may already have this information. If they need to carb count, find out school menu (some are available online) and list the meals you like, and which contain carbohydrate. Then ask school for:

- a) carbs per serving (school may already have this worked out)
- b) average weight per serving, you can use Carbs and Cals to estimate. Such as how much does a pasta pot weigh, or slice pizza or portion of chips etc.
- c) any food labels for these foods are bought in.

Use Carbs and Cals book or app in school to estimate visually.

## Common foods served at secondary school and typical carbs per portion:

| Food                       | Carbs | Food                             | Carbs   |
|----------------------------|-------|----------------------------------|---------|
| Large sausage roll         | 30g   | 1 fish finger                    | 3g      |
| Slice of pizza             | 30g   | 1 chicken nugget                 | 3g      |
| Pasta pot                  | 75g   | Serving baked beans              | 20g     |
| Toasted sandwich           | 30g   | Breaded /battered fish           | 50g     |
| Bacon bap                  | 30g   | Spaghetti bolognaise             | 36g     |
| Panini                     | 45g   | Macaroni cheese                  | 50g     |
| ½ baguette (8cm long)      | 40g   | Lasagne                          | 23g     |
| Whole baguette (16cm long) | 80g   | Pasta bake                       | 70g     |
| Wrap                       | 30g   | Flapjack (4cm x 8 cm)            | 50g     |
| Rice / noodles             | 50g   | Small Danish pastry              | 25g     |
| Fajitas                    | 48g   | Cookie (8cm diameter)            | 25g     |
| Roast potatoes (3 halves)  | 20g   | Chocolate/carrot cake/jam sponge | 35g     |
| Chips (typical portion)    | 30g   | Iced bun                         | 20g     |
| 1 scoop mash potato        | 10g   | Custard (small pot or serving)   | 25g     |
| 1 jacket potato (medium)   | 35g   | Pot of fruit (small/large)       | 10g/20g |

**If you have any comments about this leaflet or the service you have received you can contact :**

Children's Diabetes Team

Telephone: 01484 356923

[www.cht.nhs.uk](http://www.cht.nhs.uk)

**If you would like this information in another format or language contact the above.**

Potřebujete-li tyto informace v jiném formátu nebo jazyce, obraťte se prosím na výše uvedené oddělení

Jeżeli są Państwo zainteresowani otrzymaniem tych informacji w innym formacie lub wersji językowej, prosimy skontaktować się z nami, korzystając z ww. danych kontaktowych

ਚ ਤੁਸੀਂ ਇਹ ਜਾਣਕਾਰੀ ਕਿਸੇ ਹੋਰ ਖਾਸ਼ੂਪ ਜਾਂ ਭਾਸ਼ਾ ਵਿੱਚ ਲੈਣਾ ਚਾਹੁੰਦੇ ਹੋ,  
ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਉਪਰੋਕਤ ਵਿਭਾਗ ਵਿੱਚ ਸਾਡੇ ਨਾਲ ਸੰਪਰਕ ਕਰੋ।

اگر آپ کو یہ معلومات کسی اور فارمیٹ کی زبان میں درکار ہوں، تو  
برائے مہربانی مندرجہ بالا شعبے میں ہم سے رابطہ کریں۔

"إذا احتجت الحصول على هذه المعلومة بشكل مغاير أو مترجمة إلى لغة مختلفة فيرجى منك الاتصال بالقسم  
المذكور أعلاه"