

All you ever wanted to know about carbs

Kate O'Connor told the Diabetes Ireland Spring Meeting that controlling carbohydrates can help you control your diabetes, writes **Sheila O'Kelly**

All food is made up of three nutrients, protein, fat or carbohydrate. Fat and protein have very little effect on blood glucose, but carbohydrate, whether it's sugar or starch, is broken down into blood glucose.

For most people carbohydrates will appear in the blood as glucose between 15 minutes to two hours after eating, Kate O'Connor, Dietitian at St Luke's Hospital, told the recent Diabetes Ireland National Spring Meeting.

Carbohydrates and diabetes

In type 1 diabetes, the insulin response to carbohydrate is absent and for people with type 2 diabetes, the response is reduced. This leads to high blood sugars.

Sources of carbohydrate

Carbohydrates are made up of four different groups:

- Cereals
- Fruit
- Dairy
- Sugar.

"This is important. Everybody thinks of sugar causing high blood sugars, but any other sources of carbohydrates if eaten in excess will also cause high blood sugars," said Kate.



If you have type 1 diabetes any carbohydrate you eat, without an appropriate amount of insulin, will cause high blood sugar. A large bowl of porridge will have the same effects on your blood sugars as a small bowl of cornflakes. There are many foods that can have a significant effect on your blood sugars, see panel, 'Foods that affect your blood sugars'.

"It is important to consider how food is processed. A normal piece of fish will have very little effect on your blood sugars, but when it's battered or breaded then it does effect your blood sugars because of the flour on it," said Kate.

There are also foods that have little or

no effect on your blood sugars, see panel 'Foods with little or no carbohydrate'.

Do all carbs raise sugars at same rate?

No. Some raise blood sugars quickly, for example:

- Sugary drinks
- Sweets.

"We say these foods have a 'high glycaemic index'," said Kate. While some raise blood sugars slowly, for example:

- Porridge
- Pasta
- Milk.

"We say these foods have a 'low glycaemic index'," said Kate

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TOP TIPS

Glycaemic index

Everyone with diabetes should choose high-fibre low glycaemic-index carbohydrates and restrict high sugar or high processed foods. This will help:

- Your diabetes
- Your overall health
- Your heart
- Your risk of cancer

Diet

- Cut out sugary drinks
- Eat more vegetables, salads and pulses

Be consistent

- If you are on a fixed insulin regime or fixed medications learn to keep your carbohydrate intake consistent
- If you are on multiple injections or an insulin pump learn how to count carbohydrates and adjust your insulin accordingly

Lose weight

- If you have type 2 diabetes and you're overweight, concentrate on losing weight. Your sugars will then improve. This means restricting how much carbohydrates you eat – talk to your dietitian first

FOODS THAT AFFECT YOUR BLOOD SUGARS

Starchy carbohydrates that have a significant effect on your blood sugar

• Potatoes	• Potato products	• Rice
• Couscous	• Pasta	• Noodles
• Bread	• Wraps	• Flour
• Crackers	• Scones	• Pizza
• Pies	• Pastries	• All fruit
• Fruit juice	• Milk	• Milk puddings
• Yogurts		

Sugary carbohydrates that have a significant effect on your blood sugar

• Soft drinks	• Jam	• Honey
• Marmalade	• Chocolate	• Ice-cream
• Biscuits	• Cakes	• Sweets

Basic and essential advice

"So the very first advice you would give, especially when someone is diagnosed with type 2 diabetes is to cut out the sugary drinks and sweets," said Kate.

"It's still very, very basic and essential advice. It always blows me away how many patients don't cut out the sugary drinks because they will cause the blood sugars to rise immediately," said Kate.

What is glycaemic index?

"The glycaemic index is also known as the GI so if you've ever heard of the GI diet that's what they're talking about," said Kate. The Glycaemic Index (GI) measures the speed at which foods are broken down by the body to form glucose (sugar).

High GI foods

Certain high GI foods are broken down

very quickly into sugar after you consume them and are apparent in your blood-stream within an hour or two. These are foods like:

- Glucose
- Sugar
- Sugary drinks – Lucozade, 7-Up, Coke
- Jelly beans.

Low GI foods

Low GI foods spend a lot longer in your stomach because they are broken down into sugar much more slowly.

"This is very helpful especially in type 2 diabetes where you're still producing your insulin but your insulin is slow to respond, it's reduced," said Kate.

If you eat a low GI diet it may reduce your HbA1c by up to 0.5%. This is very significant.

How to choose a low GI diet

Eat more vegetables, salads and pulses. They have very little effect on your blood sugars and pretty no effect on your weight, see panel, 'How to choose a low GI diet'.

Cut out the sugar in tea, sugary drinks, sweets and chocolates.

How to improve GI of your meal

- Always have a balanced meal instead of just carbohydrate, for example potatoes, meat and vegetables instead of just potatoes
- Fill one third to one half of your plate



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FOODS WITH LITTLE OR NO CARBOHYDRATE

Food that contains no carbohydrate will have little or no effect on your blood sugars. These include protein foods like:

- Meat
- Fish
- Cheese
- Poultry
- Eggs

They also include:

- Vegetables
- Salads
- Tea/Coffee
- Coffee
- Sweeteners
- Fats
- Herbs and spices

There are also foods like nuts and pulses that even though they do contain carbohydrate are so high in either fibre or protein that they tend to have very little effect on the blood sugars.

So they are often included in this group because they have no effect on your blood sugars, no direct effect on your blood sugars

with vegetables, pulses and salad

- Watch the overall amount of carbohydrate not just the type especially if you need to reduce weight or if you are on insulin.

Avoid a meal that is all carbohydrates

"Don't have a jam sandwich for lunch," said Kate.

"The jam and the bread are both carbohydrates and high GI. Change to brown bread and instead of putting jam on it but meat or chicken or fish on it.

"Instead of having say a meat sandwich on its own, always put something like lettuce, tomatoes, peppers or other salad in it. Include something like a piece of fruit or a diet yogurt with it.

"Mixing the type of foods you eat together can lower the overall GI of your meal," said Kate.

And the amount of carbohydrate?

"So the question is do I need to watch the amount of carbohydrate I eat. Again, the answer is 'yes'.

MEDICAL SUPERVISION NEEDED FOR LIQUID DIETS

Very low-calorie liquid diets should only be used under medical supervision. They're less than 800 calories in liquid form that completely replaces normal food intake, Kate O'Connor told the Diabetes Ireland National Spring Meeting. The maximum recommended continuous use is 12 weeks.

This was the diet that was used in the 2011 Newcastle Reversal of Diabetes Study and in *Operation Transformation* [as featured in the last issue of *Diabetes Ireland*].

"The Newcastle Study is actually very exciting. In 2011 in Newcastle 13 people with type 2 diabetes were put on a 600 calorie a day diet. That wouldn't even be a bowl of cereal in the morning so it's a very small amount of calories.

"What was very exciting was not so much that their insulin was now working better, but when they actually took MRI scans of their pancreas all the fat that had clogged up in their pancreas had now cleared so the beta cells that produce insulin were now working perfectly again," said Kate O'Connor.

"We really don't know what sort of results there are going to be after one year. That was only after 12 weeks. It's very preliminary.

"The other thing before people start getting too excited is that most people in the study were:

- Aged about 50 years
- Had had diabetes for less than four years
- Were otherwise healthy.

"The big question is would it be possible to see such a reversal if you had diabetes more than 10 to 15 years? All the participants in the study had diabetes for less than four years and obviously if they're going to keep this weight down and keep their diabetes at bay they're going to at some stage have to adapt healthy eating patterns and regular exercise to maintain weight loss," said Kate O'Connor.

EXAMPLES OF GLYCAEMIC INDEX VALUES

High (more than 70)	Medium (55-70)	Low (less than 55)
• Cornflakes	• Muesli	• Porridge
• Baguette	• Pita bread	• Wholemeal rye bread
• Instant rice	• Basmati rice	• Pasta
• Instant mashed potato	• Steamed potato	• Sweet potato
• Watermelon*	• Pineapple	• Apple

*Although watermelon is technically a high GI food, you would have to eat very large amounts of it before it would affect your blood sugar

"So what I say to the patients is that when you're doing the shopping trolley and you're in the supermarket you want to make sure you're filling it up with your vegetables, your salads, your brown breads, your porridge and you're choosing all the right food, your lean meat and your chicken and your fish," said Kate.

"Once you're at home then it's what you put on your plate and the amount.

That matters as well, because even if it's good food the amount of it makes a difference to your blood sugars."

Stick to a carbohydrate routine

If you take a regular fixed amount of tablets of insulin each day you should take a regular amount of carbohydrate each day to avoid fluctuations in blood sugars.

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Dietitian Kate Moran speaking at the recent Diabetes Spring Meeting

"The number one cause for wildly fluctuating blood sugars is a change in your carbohydrate intake.

"So eat regular meals that include a similar amounts of carbohydrate with each meal to help control your blood sugar," said Kate.

Adjust insulin to your carbohydrates

If you are on multiple injections or an insulin pump you should adjust your insulin according to the amount of carbohydrate you eat.

"So just to give you an idea, one type of breakfast could require a person to take seven units, but another type of breakfast could require them to take 45. You can see there is quite a big difference in the amount of insulin required," said Kate.

If overweight reduce what you eat

If you're overweight, reduce how much you eat including carbohydrate. "For type 2 diabetes, weight management is the primary nutritional strategy in managing glucose control," said Kate.

If you are overweight with type 2 diabetes regular, moderate physical activity can reduce HbA1c by 0.45 to 0.655% – independent of weight loss.

"Focus on reducing your total energy intake rather than reducing only carbo-

hydrate," said Kate

Weight management is the most effective treatment for overweight and obese people with type 2 diabetes. Between 80 to 90% of people with type 2 diabetes are overweight and 60 to 90% of type 2 diabetes is obesity related.

So for weight loss, calories in must be less than calories out.

"There is no magic bullet to weight loss. What you're eating makes up of carbohydrate, protein and fat and alcohol," said Kate.

"Calories out include everyday activity so spending less time sleeping, less time watching television, less time with computers all helps, but also getting in at least 30 minutes a day exercise if at all possible would help burn your calories," said Kate.

Weight loss options

The option most people are familiar with is a low-fat diet with healthy eating. There's also an option of:

- A low carbohydrate diet
- A very low calorie liquid diet
- Meal replacements
- Physical activity.

If you walk into a dietitian, doctor or nurse tomorrow this will be the first choice presented to you:

- Low fat
- Lots of fruit and vegetables
- Portion control
- Exercise.

"This is a diet quite similar to somebody going through cardiac rehab. This will help your heart by getting rid of some of the saturated fat and you may also see a reduction in your cholesterol," said Kate. If you look at where calories are coming from, you'll see that:

- For every gram of carbohydrate you'll get four calories
- For every gram of pure protein – lean chicken, fish, eggs – you'll get four calories
- For every gram of fat you'll get nine calories.

Cut out the butter

"For example, if you had a fairly decent

HOW TO CHOOSE A LOW GI DIET

- Choose a high fibre breakfast cereal like porridge or All-Bran
- If you choose a high GI cereal, add berries, nuts, flaxseed or cinnamon
- Choose dense, whole grain and sourdough breads and crackers
- Eat at least three portions of vegetables, salads and pulses a day
- Replace white potatoes with sweet potatoes or yams or eat smaller portions of white potatoes
- Cut out refined sugars and convenience foods.

size, say three scoops of potatoes you're going to be looking at about 100 calories. If you put a tablespoon of butter on it you've added another 100 calories. So if you took away the butter from your dinner you're still left with a dinner but if you took away the potato you're left there going okay where's my dinner gone?" said Kate.

"So always go after the butter first and the fat on the meat first. That makes it an easy win."

Reduce alcohol

"Alcohol is also another very easy win and one I think that maybe people ignore. They try really hard all week to lose weight, go out on a Saturday night and have 10 pints and then wonder when they arrive in the doctor's surgery on a Monday morning why they haven't lost weight.

"The reason is you're talking seven calories per gram. To put that in context a pint of beer is about 200 calories. So to burn off 200 calories you need to walk about two miles. So the five pints on a Saturday night, that's the 10-mile walk on your Sunday negated.

"For those who drink wine, most bottles of wine are 500-600 calories.

"So if you're having a bottle of wine over the dinner you might be planning to miss dessert, but it might be more beneficial to miss out on the bottle of wine," said Kate.