

Carbohydrate counting and diabetes

Foods that contain carbohydrate are an important source of fuel for your body. These foods include bread, pasta, rice, grains and cereals, legumes, fruits, starchy vegetables, milk and yoghurt. Your body breaks down carbohydrates into glucose in the bloodstream. Glucose is used by the body's cells for energy.

It's important to know how much carbohydrate is in the food you eat to understand the effects on your blood glucose levels. This can help you with managing your diabetes. Carbohydrate counting is a way of estimating the amount of carbohydrate in different foods.



Why is the amount of carbohydrate important?

All carbohydrates are converted to glucose within about two hours of eating, directly affecting your blood glucose levels. Spreading carbohydrate foods evenly across the day can help maintain energy levels and keep your blood glucose levels within your target range.

- » Eating too much carbohydrate at one time can result in high blood glucose levels after meals.
- » Eating too little carbohydrate can result in low energy levels. If you use insulin or certain types of blood glucose lowering medications, eating too little carbohydrate or skipping a meal can make your blood glucose level drop too low and cause hypoglycaemia (a hypo).

How to count carbohydrates

The amount of carbohydrate in food can be counted using a number of different methods. Counting carbohydrate exchanges is one way of estimating the amount of carbohydrate in food.

A carbohydrate exchange is an amount of food that contains approximately 15 grams of carbohydrate. Exchanges don't refer to the weight of a food – for example, a slice of bread can weigh 40 grams but only contain 15 grams of carbohydrate (one exchange).

Different carbohydrate foods can be ‘exchanged’ for one another so that you consume a similar amount of carbohydrate. Some examples of one carbohydrate exchange include:

- » 1 slice of bread
- » 1 medium apple
- » 1/3 cup of cooked rice
- » 1 cup of milk.

Sometimes carbohydrates may be counted in grams instead of exchanges. This method is most commonly used by people who manage their diabetes with an insulin pump or multiple daily injections (MDI).

Another way to count the amount of carbohydrate in food is by counting carbohydrate portions. A carbohydrate portion (CP) is the amount of food that contains 10 grams of carbohydrate. This method is most commonly used by people who follow the Dose Adjustment For Normal Eating (DAFNE) program.

For more information about the different methods of carbohydrate counting and what is best suited to you, talk to a dietitian.

How much carbohydrate should you eat?

The amount of carbohydrate you need each day depends on your age, gender, weight and activity levels. Talk to a dietitian about your individual needs.

The following table gives a general guide to the amount of carbohydrate the average Australian man and woman may need at each main meal (breakfast, lunch and dinner).

	Grams of carbohydrate at main meals	Carbohydrate exchanges
Women	30 – 45	2 – 3
Men	45 – 60	3 – 4

What about snacks?

If you use insulin or certain types of blood glucose lowering medications, you may need to eat a carbohydrate-based snack in between meals and before going to bed to prevent a hypo.

If you need snacks, aim for 1–2 carbohydrate exchanges per snack (that is, 15–30 grams of carbohydrate).

Sample meal plan

This meal plan is an example of what carbohydrate counting looks like across a day.

Each main meal provides three (3) carbohydrate exchanges and each snack provides one (1) carbohydrate exchange. The carbohydrate foods are in bold.

Meal	Food	Carbohydrate exchanges
Breakfast	1/2 cup natural muesli with 250ml low-fat milk and 1/2 cup berries	3
Snack	1 small banana	1
Lunch	2 slices wholegrain bread with 1/2 cup baked beans	3
Snack	1 apple and 30g unsalted raw nuts	1
Evening meal	100g grilled chicken/ beef/tofu stir-fried with ginger and garlic, 2 cups mixed vegetables, and served with 1 cup cooked basmati rice	3
Snack	100g low-fat fruit yoghurt	1



Carbohydrate exchanges

A carbohydrate exchange list provides information about the serving size of food that is equal to one exchange (15 grams of carbohydrate). Examples are shown in this table. Note that these are a general guide and the amount of carbohydrate in food can vary between brands.

Carbohydrate food	One exchange (15 grams of carbohydrate)
Bread and bread products	1 regular slice of bread/fruit bread 1 small roti/chapatti 1 crumpet – round shape ½ bread roll or ½ English muffin ½ wrap or ½ pita ‘pocket’ bread / ¼ large pita bread ¼ bagel
Breakfast cereals	⅓ cup raw rolled oats ¼ cup natural muesli containing dried fruit 1½ wheat biscuit type cereal ½ cup flake type cereal with dried fruit
Rice/pasta/grains/flour	½ cup cooked pasta ½ cup cooked noodles (rice/egg/soba) ⅓ cup cooked rice/quinoa/couscous ½ cup cooked barley/bulgur (cracked wheat) 2 tablespoons flour/corn flour/raw polenta
Biscuits/crackers	9 rice crackers 2 thick/3 thin rice or corn cakes 2-3 plain crispbreads, medium size 6 plain crispbreads, small squares/rounds 2 plain sweet biscuits/fruit slice biscuit
Starchy vegetables	1 small potato (70g) or ½ cup mashed potato ½ cup sweet potato (100g) ½ cup sweet corn kernels or 1 medium cob (170g)
Legumes	½ cup cooked/canned bean mix including chickpeas, kidney beans, cannellini beans, baked beans ¾ cup cooked/canned lentils
Fruit	1 medium apple/pear/orange/peach 1 small banana (½ medium) 1 small mango (½ medium) 3 small apricots 3 small or 2 medium mandarins 2 kiwifruits/plums/small nectarines 1½ cups diced rockmelon/watermelon/honeydew 1 cup berries/cherries/canned fruit (drained) ½ cup grapes 1 tablespoon sultanas 4 dried dates/prunes
Milk and milk products	250ml low-fat milk/soy ½ cup evaporated skim milk 200g diet yoghurt/natural yoghurt 100g low-fat fruit yoghurt ½ cup low-fat custard

Reading food labels

You can also use the nutrition information panel on a food label to work out the number of carbohydrate exchanges in the food you eat. The nutrition information panel shows the total grams of carbohydrate per serve.

Nutrition information

Servings per package: 5

Serving size: 140g

	Quantity per serving	Quantity per 100g
Energy	285KJ	203KJ
Protein	0.5g	0.3g
fat		
– Total	0.1g	0.1g
– Saturated	0.1g	0.1g
Carbohydrate – Total	15.5g	11g
– Sugars	12.2g	8.7g
Sodium	7mg	5mg

For example if you ate one serve of this food, this would provide 15.5 grams of carbohydrate which is equal to one carbohydrate exchange.

This table can help you to calculate the number of exchanges when reading a nutrition information panel.

Total grams of carbohydrate per serve	Carbohydrate exchanges
7 – 11	½
12 – 18	1
19 – 26	1½
27 – 33	2
34 – 41	2½
42 – 48	3



More information

An accredited practising dietitian (APD) can provide more information and advice on carbohydrate counting and whether you need to have snacks between meals.

Recommended carbohydrate counting books include:

- » *The Traffic Light Guide* carbohydrate counter
www.thetrafficlightguide.com.au
- » Allan Borushek's *Calorie, fat & carbohydrate counter*
www.calorieking.com.au

Recommended apps include:

- » The Traffic Light Guide to Food app
www.trafficlightguide.com.au/app
- » CalorieKing Australia Food Search app



The NDSS and you

The NDSS provides a range of services to help you manage your diabetes. These include our Infoline and website for advice on diabetes management, NDSS products and a range of support programs to help you learn more about managing your diabetes.

Published June 2016