



# CARBOHYDRATE GUIDE

# Carbohydrate guide

## Nutritional goal:

To achieve stable blood glucose levels (that do not fluctuate severely)

## Insulin goal:

To inject the correct units of bolus insulin per meal

If your diabetes is under control, you can enjoy your life without major limitations. A basic knowledge of carbohydrates will help you achieve this goal

## How to achieve this:

1. The basics
2. Learn how to estimate carbohydrates
3. Test meals (to work out the correct insulin dose)

## 1. The basics

**Carbohydrates** are broken down by the body into sugar (glucose) (which increases blood glucose levels) and provide our cells with energy.

**Fat, protein and dietary fibre**, on the other hand, are not broken down into sugar and thus only have an indirect effect on blood glucose levels. They slow down the rate at which carbohydrates are absorbed into the blood and thereby lower the glycaemic index of the meal.



## 2. Learn how to estimate carbohydrates

Carbohydrates are measured in grams of food and can be counted as carbohydrate portions (CPs) or bread exchange units (BEs).

1 CP/BE = around 10g of carbohydrates (CH)

**NB:** 10 grams of carbohydrates are NOT equal to 10 grams of food.

### Step 1: Weigh carbohydrates

To get to know the amount of carbohydrates and their proportions in different foods, start by weighing the individual foods. By using the nutritional information on the food packaging or a carbohydrate chart (see pages 3-7), you can calculate the exact number of carbohydrates you have eaten.

1 portion of cooked spaghetti (about 320g) corresponds to about 80g of carbohydrates.

320g of cooked spaghetti corresponds to around 120g of uncooked spaghetti



### Step 2: Estimate carbohydrates

Over time you will learn to estimate the number of carbohydrates and portion sizes without weighing your food. You can now start to estimate the quantity of food and amount of carbohydrates before using your kitchen scales to weigh the food. Continue to do this until the value you estimate is the same as the actual value.

Please contact a specialist for comprehensive advice and a diet tailored to your individual needs.

## Carbohydrate charts

Breakfast	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Birchermüesli (oats, nuts, dried fruit), made up	55g	2 tbsp.	5g	75
Birchermüesli flakes (oats, nuts, dried fruit), dry	15g	2 tbsp.	+	55
Butter	∞	Nutritional values for 10g	10g	75
Chocolate-hazelnut spread	15g	1 heaped tsp. or 1/2 individual portion	5g	85
Corn flakes	10g	3 tbsp.	+	35
(Chicken) egg	∞	Nutritional values for 60g (Ø egg)	5g	85
Honey	15g	1 heaped tbsp. or 1/2 individual portion	0	45
Jam	15g	1 tsp.	+	35

Milk and yoghurt	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Fruit-flavoured yoghurt, skimmed milk, with sweeteners	125g	1 pot	+	60
Semi-skimmed milk	205ml	1 cup	5g	115
Yoghurt, plain	180g	1 pot	5g	130
Yoghurt, strawberry flavoured, with sugar	60g	1/3 pot	+	60

Bread	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Crispbread, wholegrain	15g	2 crispbreads	+	50
Croissant	25g	1/2 croissant	5g	90
Halbweissbrot (bread made with half whole-wheat flour and half white flour)	20g	1/2 slice	+	45
Wholegrain bread	25g	1 slice	+	60
White bread	20g	1/2 slice	+	50
Zwieback (rusk)	15g	2 rusks	+	60



Fruit	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Apple, dried	15g	2-3 rings	+	40
Apple, pear	70g	1 small	+	35
Apricot	85g	2	+	40
Apricot, dried	15g	2	+	30
Banana, peeled	45g	1/2 small	+	40
Blackberry, raspberry	80g	1 handful	+	25
Cherry	90g	1 handful	+	65
Coconut, peeled	210g	1 piece, size of a CD	75g	750
Dates, dried	15g	1	+	45
Fig	55g	1	+	40
Grape	60g	5-6	+	40
Honeydew melon, peeled	115g	1/8	+	40
Kiwi fruit	80g	1 small	+	40
Orange, peeled	95g	1 small	+	40
Peach	85g	1 small	+	35
Pineapple, fresh, peeled	80g	2 slices	+	40
Pineapple, tinned, sweetened	45g	1 slice	+	40
Stewed apple, sweetened	45g	2 tbsp.	+	40
Strawberry	110g	2 handfuls	+	40
Watermelon, peeled	150g	1 slice	+	45

Tip: The weights in each case include the edible part only, that is, without the pip (e.g. in the case of apricots) and without the core (e.g. in the case of apples).

### Key:

- CH carbohydrates
- kcal kilocalories
- + trace amounts
- ∞ almost no carbohydrates and thus not relevant to blood glucose levels
- tbsp. tablespoon
- tsp. teaspoon



Main meals	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Eierspätzli (short, thick egg noodles)	35g	2 tbsp.	+	55
French fries	25g	7	5g	75
Ketchup	35g	1½ to 2 tbsp.	+	40
Mashed potato, made up	75g	3 tbsp.	+	65
Pasta, cooked	40g	2 tbsp.	+	55
Pasta, uncooked	15g	2 tbsp.	+	55
Polenta, cooked	75g	3 tbsp.	+	50
Polenta, uncooked	15g	2 tbsp.	+	50
Potatoes, raw and cooked	60g	1 egg-sized potato	+	45
Rice, cooked	45g	2 tbsp.	+	55
Rice, uncooked	15g	2 tbsp.	+	55

Drinks	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Coffee, black	∞		0	+
Cola	95ml	1 dl	0	40
Diet cola	∞		0	+
Energy drink	90ml	1 dl	0	40
Energy drink, no added sugar	∞		0	+
Iced tea	135ml	1.3 dl	0	40
Orange juice	90ml	1 dl	0	40
Water	∞		0	0



Ready meals, cooked	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Äpler Makkaroni (pasta with potatoes, onions, bacon, cream and cheese)	45g	2 tbsp.	+	65
Bami Goreng (Indonesian stir-fried noodle dish)	50g	2 to 3 tbsp.	+	65
Meat lasagne	85g	2 to 3 tbsp.	5g	110
Mah Mee (Chinese noodle dish) with chicken	65g	3 tbsp.	+	80
Pasta carbonara	45g	2 tbsp.	+	65
Tomato risotto	40g	2 tbsp.	+	60

Fast food	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Hot dog	45g	1/5	5g	55
Pizza Margherita (approx. 420g)	30g	1 thin slice	+	75
Pizza with ham (approx. 420g)	30g	1 thin slice	+	70
Kebab (meat only)	∞	Nutritional values for 100g	20g	280
Falafel	50g	1½ apricot-sized balls	5g	115
Pita	25g	1/4	+	55
Naan	25g	1/4	+	50
McDonald's:				
Cheeseburger	40g	1/3 cheeseburger	5g	100
Big Mac	55g	1/4 burger	5g	125
McChicken	45g	1/4 burger	5g	100
Veggie Burger	40g	1/5 burger	5g	80
Chicken McNuggets	65g	3-4	10g	152
French fries	25g	7	5g	75

Savoury snacks	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Erdnuss-Flips (peanut butter flavour puffed corn snacks)	15g	3 tbsp.	5g	75
Corn tortilla chips (triangular)	15g	6	5g	75
Crisps/potato chips	20g	1 handful	5g	110
Laugen-Salzbretzel (pretzels)	15g	6	+	60
Popcorn, salted	15g	3 dl cup	+	50

Sweet snacks	10g CH correspond to	corresponds to approx.	contains g fat	contains kcal
Cereal bar, crunchy	15g	¾ bar	5g	70
Cereal bar with apple and chocolate, soft	15g	½ bar	5g	70
Gummy bears	15g	2-3	+	50
Kinder Chocolate, bar	20g	1	5g	110
KitKat, 45g	15g	⅓	5g	80
Mars, classic, 45g	15g	¼ - ⅓	+	65
Milchschnitte (Kinder cake slice with creamy filling), 28g	30g	1	10g	125
Peanut M&Ms, 45g	15g	⅓ bag	5g	70
Smarties	15g	15	5g	70
Snickers, 60g	20g	⅓	5g	100
Tablerone	15g	½	5g	80



Desserts	1 serving weighs approx.:	contains g CH	contains g fat	contains kcal
Black Forest gâteau	120g	45g	20g	390
Crèmeschnitte (vanilla slice)	80g	40g	10g	230
Doughnut	60g	25g	10g	195
Linzerörtli (individual Linzertorte with raspberry jam and lattice pastry)	75g	45g	10g	310
Milk chocolate	1 row = 20g	10g	5g	105
Nussgipfel (croissant with nut filling)	100g	45g	25g	445
Nusstörtli (individual nut cake)	80g	45g	20g	400
Slice of carrot cake, 3cm wide	70g	30g	10g	245
Slice of chocolate cake, 2cm wide	65g	30g	15g	265
Vanilla pudding	125g	20g	5g	125

Source: Swiss Food Composition Database, 2009, and information from companies, last updated: October 2012 (figures rounded to nearest 5)

## Glycaemic Index



The glycaemic index indicates how quickly a food containing carbohydrates enters into the bloodstream after it has been eaten.

Foods with a high glycaemic index shoot into the bloodstream and are not very filling. If your quick insulin response is not assured, your blood sugar soars after eating, which adversely affects your regulation of your total blood sugar. Foods with a low glycaemic index increase blood sugar slowly and are more filling over a longer period of time, which has a positive effect on your blood sugar.



Liquid carbohydrates (soft drinks, fruit juice, chocolate drinks, etc.) or carbohydrates with a mushy consistency (white bread, corn flakes, risotto) always have a high glycaemic index and pass at lightning speed into your bloodstream. When you combine

in the same meal carbohydrates with fat, protein and/or dietary fibre (salad, vegetables, whole-grain starch products such as whole-grain bread), you slow down the influx of carbohydrates, and your blood sugar will be lower after eating.

## Examples from everyday life



**1 bowl of corn flakes with 2dl milk (approx. 240g)**

contains:  
approx. 40g carbohydrates



**1 bowl of raspberries (approx. 80g)**

contains:  
approx. 10g carbohydrates



**Pizza Margherita (approx. 420g)**

contains:  
approx. 140g carbohydrates



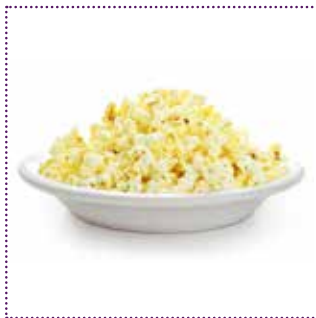
**1 plate of meat lasagne (approx. 470g)**

contains:  
approx. 55g carbohydrates



**1 doughnut (approx. 60g)**

contains:  
approx. 25g carbohydrates



**1 portion of popcorn (approx. 22g)**

contains:  
approx. 15g carbohydrates



**Zurich-style Geschnetzeltes (sliced veal in a cream sauce) with Röstli\***

contains:  
approx. 55g carbohydrates

\*200g Röstli prepared from 300g raw potatoes;  
Zurich-style Geschnetzeltes likewise contains carbohydrates from thickening

## National Dish



### **Fish & Chips with mayonnaise**

contains:

approx. 85g of carbohydrates

Battered fish fillet (cod) and fried potatoes (chips); total weight per person of approx. 450g contains approx. 85g of carbohydrates

## Useful Information

### Sweeteners and Light/Zero Beverages

Artificial sweeteners (e.g. aspartame, acesulfame K, saccharin, cyclamate) – not to be confused with sugar substitutes (e.g. sorbitol, xylitol, maltitol) – have no scientifically conclusive and proven influence on the insulin balance, blood sugar level or hunger sensation, not even in overweight individuals. Thus, if someone would like to save calories, reduced-calorie, artificially sweetened food and beverages are definitely sensible alternatives to normal products that contain sugar – but of course only if they are eaten instead of and not in addition to them.



### Fruit Sugar

Fruit sugar – also known as fructose – occurs naturally in fruits and honey. Significant amounts are found in dried fruits and honey. Even half of table sugar consists of fructose. For a number of years now, so-called high fructose corn starch (HFCS) made from corn, also known as fructose syrup, has been used as an inexpensive sweetener in beverages and foods. Avoid fructose in this form; it reinforces existing insulin resistance and can increase your blood lipids. Both can lead to poorer blood sugar regulation.

Source: [www.sge-ssn.ch](http://www.sge-ssn.ch)

### 3. Test meals

Every individual reacts differently to insulin. This is why no general information about doses can be provided.

The easiest way to find out how your body reacts to the amount of carbohydrates in different types of food and the administered insulin units is through test meals.

#### Procedure:

1. Check your blood glucose levels before eating carbohydrates
2. Weigh the amount of carbohydrates in the meal
3. Eat the weighed-out meal
4. Check your blood glucose levels after two hours
5. Check: Did you achieve your target values\*?

**Yes:** Enjoy the tested food with a clear conscience.

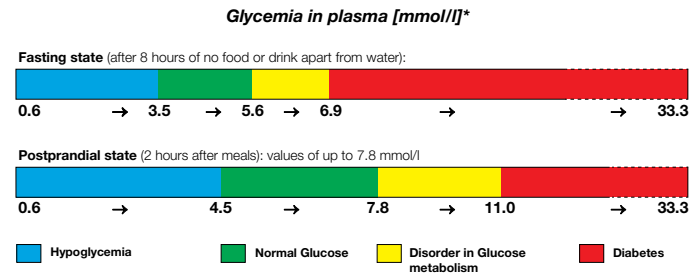
- No:**
- ➔ Change the insulin-carbohydrate factor
  - ➔ Rethink the quantity
  - ➔ Plan some exercise for after your meal

Repeat the test meal until you have achieved your target values.

### \*Target values:

**Fasting state** (after 8 hours of no food or drink apart from water): **values of up to 5.6 mmol/L**

**Postprandial state** (2 hours after meals): **values of up to 7.8 mmol/L** Please contact a specialist to work out your personal target values for before lunch/dinner.



Status: January 2009

\*Source: Diabetes Care, Standards of Medical Care in Diabetes—2011, 30, 2010 vol. 34 no. Supplement 1 p.11-S61





This “Carbohydrate guide” was compiled in cooperation with Ms Natalie Zumbrunn-Loosli, certified nutrition consultant (FH) and specialist in the field of diabetes mellitus.

[www.kep-zh.ch](http://www.kep-zh.ch)

3rd Revised edition, 2016

## Any questions or suggestions?

We would be delighted to help you and look forward to your feedback.

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