

Knowing about Carbs

Carbohydrates and their relationship with insulin

Carbohydrates are the main source of energy in food that fuels children's metabolism, supports growth and maintains overall health. Carbohydrates are present in varying amounts in most foods. These includes fruits, vegetables, grains, beans, legumes, milk, milk products and foods with sugar such as candy, soda and other sweets. If there is enough insulin present in the body naturally or provided by injections, it will utilize the carbohydrates. However, if body is producing less or no insulin, then blood sugar is bound to rise.

Types of carbohydrates¹

- **Sugars (also known as simple or fast acting carbohydrates)**
- **Starches (also known as complex carbohydrates or slow acting carbohydrates)**
- **Fiber**

Good Carbs - Complex carbohydrates which are full of fiber and get absorbed slowly into our systems, resulting in fewer spikes in blood sugar levels are good carbohydrates. E.g whole wheat bread, cereals and veggies like corn, potatoes and carrots.



Whole Grain Breads



Brown Rice



Vegetables



Fresh Fruits

Bad Carbs - Refined and processed carbohydrates that contain large amount of sugars and lack fiber are called bad carbohydrates. E.g



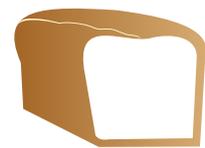
Candy, Sweets & Desserts



Sugared Cereals



Sweetened Drinks



Refined Breads

However all carbs can raise blood sugar levels if there is no insulin or less insulin in the body. It's easier for people to control their diabetes if they eat about the same amount of carbs at about the similar time each day.

No wonder knowing what kind and how much carbohydrate to eat can be confusing!

Let us learn

1. Ask your Dietician or physician about the carbohydrate content (CHO) of common food items you eat. Check table 1 for some examples

Table 1 ²	Quantity	CHO Content
Cooked Rice	1/3 Cup	15
Chapati 1 medium 6 Inch	1 medium	15
Vegetable (Non Starchy)	1 Cup	5
Poha	½ Cup	15
Curds	½ Cup	6
Milk	1 Cup	12
Apple	1 small	15

2. Read nutrition label. The term **"total carbohydrate"** includes all the types of carbohydrates. This is the number you should pay attention. In general, an excellent source of fiber contains five grams or more per serving, while a good source contains 2.5 to 4.9 grams of fiber per serving.¹

Start Here

Check Serving Size

Check Calories

Limit These Nutrients

Get Enough of These Nutrients

Nutrition Facts	
Serving Size 1/2 cup (114g)	
Servings Per Container 4	
Amount Per Serving	
Calories 90	Calories from Fat 30
	% Daily Value*
Total Fat 3g	5%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 300mg	13%
Total Carbohydrate 13g	4%
Dietary Fiber 3g	12%
Sugars 3g	
Protein 3g	
Vitamin A 270%	Vitamin C 10%
Calcium 2%	Iron 4%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:	
	Calories 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 30g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Quick Guide to % Daily Value

5% or less is low
20% or more is high

Footnotes

3. Calculating Insulin to carbohydrate ratios³

- Calculate total daily insulin dose (TDD)- for 24 hours
- $500 \div \text{Total Daily Insulin Dose} = 1$ unit insulin covers so many grams of carbohydrate
- Example: Assume TDD= 40 units = $500 \div 40 = 12 = 1$ unit of rapid acting insulin covers 12 gm carbohydrates

Remember that the ratio is a starting point, to be evaluated by blood-glucose testing and then revised and refined as needed to reach your blood-glucose targets. Also it will change as the child grows.

For people with type 1 diabetes, insulin requirement is to be matched with the amount of carbohydrates one eats and drinks. Three rules to be followed

- One needs to count carbohydrates and match with appropriate dose of insulin
- One needs to understand approximate minimum and maximum limit of carbohydrates per meal and per day
- One needs to have more of good carbohydrates

1 <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/types-of-carbohydrates.html>

2. https://www.aace.com/sites/all/files/aapi_guide_to_nutrition_health_and_diabetes.pdf

3. <http://dtc.ucsf.edu/types-of-diabetes/type1/treatment-of-type-1-diabetes/medications-and-therapies/type-1-insulin-therapy/calculating-insulin-dose/>