

# Insulin 301: Matching Insulin to Food

Matching the curve of insulin absorption to that of food and your bodies' circadian rhythm may sound easy enough . . . But how do you know how much insulin you really need?

If you eat at the same time each day, eat the same amount of food at every meal, and have a similar level of activity and stress each day, your Doctor may be able to predict how much insulin you will need. . . But very few of us eat and live with that degree of consistency. When you don't know how to match your insulin dosage to the amount of food that you eat, your Doctors recommendation of how much insulin to take is little more than his best "guess" at how much insulin you will actually need . . . and his hope that the nutrient content of your meals is always the same.

In order to maximize your flexibility in the timing of insulin dosage, and the size and content of your meals, you need to be able to calculate your insulin dosage based on the amount of food that you eat. This can be done with the use of Carb (*short for Carbohydrate*) or Nutrient Counting, and formulas that allow you to calculate how much insulin you need, based on your blood sugar level, and the amount of food that you eat.

## Carb Counting:

The **first step** is learning how to Count Carbs so you can determine the Carbohydrate content of the foods that you eat. Food labels\* provide the information that is needed:

### Nutrition Facts

Serving Size 1 cup (30g)	
Servings Per Container About 9	
<b>Amount Per Serving</b>	
<b>Calories</b> 110	Calories from Fat 5
<b>% Daily Value</b>	
<b>Total Fat</b> 0.5g	<b>1%</b>
Saturated Fat 0g	<b>0%</b>
Trans Fat 0g	
<b>Cholesterol</b> 0mg	<b>0%</b>
<b>Sodium</b> 160mg	<b>7%</b>
<b>Total Carbohydrate</b> 25g	<b>8%</b>
Dietary Fiber 0g	<b>0%</b>
Sugars less than 1g	
<b>Protein</b> 2g	

Serving Size

and

**Total Carbs**  
(Short for Carbohydrate)

Once you know the number of Carbs in each serving, you can calculate the total number of Carbs you will eat, based on the number of servings you intend to eat:

$$2 \text{ cups} = 2 \text{ Servings} \times 25\text{g Carb} = \mathbf{50 \text{ Carbs}}$$

Then, you need to add up the total number of Carbs in all the foods you intend to eat.

If the foods you eat do not have food labels, there are other places you can look to find out the necessary information:

1. Most fast food chains have nutrient and carbohydrate information available upon request, or on their website. Many local restaurants provide the same.
2. You can purchase food guides that provide the nutrient content of most foods, such as *“The Complete Book of Food Counts, 8th Edition”* by Corinne Netzer, or *“The CalorieKing Calorie, Fat & Carbohydrate Counter 2010”* by Allan Borushek. You can also search the CalorieKing Online Food Data Base at: [www.calorieking.com/foods/](http://www.calorieking.com/foods/)
3. And, if you can’t determine the exact number of Carbs in your food, that’s OK too, because you can get pretty good at guessing . . . once you learn the Carb number of your favorite, most commonly eaten foods. When you guess, it is helpful to write down the Carb number that you “guessed” and monitor your blood sugar level 1 ½ to 2 hours later and then again in 3 to 4 hours, to see how closely you guessed. Then, if your blood sugar has not come back to target, or drops below target, you can aim for a closer guess the next time around!

### **I:C Ratio:**

The next thing you need to know is your **I:C Ratio** or *Insulin to Carb Ratio*. Your I:C ratio is a number that allows you to calculate how many units of insulin you need for the number of Carbs you eat. **Each person’s I:C Ratio is different and must be calculated by your Doctor** with use of formulas based on your body weight, total daily insulin dosage, and other factors that your Doctor considers, specific to your diabetes.

Once you know the total number of Carbs you intend to eat, you divide that number by your I:C ratio to determine how much insulin you should take. For example, if your I:C ratio is 15 you would need 1 unit of insulin for every 15g (grams) of Carb that you eat:

$$\mathbf{\text{Total Carbs} \div \text{I:C Ratio} = \text{Units of Insulin needed}}$$

If your Doctor hasn’t given you an I:C ratio, get with your Dietitian and learn all you can about Carbs. Practice counting Carbs until you know the Carb content of most of the foods that you eat. Then at the time of your next visit with your Doctor, show them what you have learned, and ask them to calculate your I:C ratio.

## ISF:

In addition to an I:C Ratio, your Doctor can give you an **ISF** (*Insulin Sensitivity Factor*) often referred to as a *Correction Factor*. This number allows you to calculate how much insulin you need for a “correction” to bring high blood sugar levels back within your target range. The formula looks like this:

$$\text{Blood Sugar} - \text{Target BG (100)} \div \text{ISF} = \text{Units of Insulin}$$

(Amount of insulin needed to bring blood sugar back to Target)

If all these calculations make your head spin, there is HOPE. Your Dietitian can help you learn useful tricks that make it easy, or you may consider use of a SMART Insulin Pump that takes the guess work out of calculation.

The better you get at Carb counting, and calculation of your insulin dosage, the less likely it is that your blood sugar will rise quickly after meals, or require a correction dosage to bring your numbers back to target . . . And the less your blood sugar fluctuates, the better you feel, with less risk of severe hypoglycemia (*low blood sugar*).

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\*To learn more about Nutrition Labels check out the *FDA Food Labeling Consumer Information Guide*:  
[www.fda.gov/Food/LabelingNutrition/ConsumerInformation/ucm078889.htm](http://www.fda.gov/Food/LabelingNutrition/ConsumerInformation/ucm078889.htm)