

Nutritional guidelines for diabetics

Mini review

Nutrition is the cornerstone for managing diabetes and preventing its complications. Meal planning for diabetes is more than just cutting back on starch or sugar. There are many options for planning meals, by choosing the right meal planning tool, diabetics can try new foods, enjoy their favorites and keep their blood sugar levels in control.

You may want to try all options to find which one works for you best, or use a combination to help regulate your blood sugar level

My plate: My plate is an easy way to get started with managing blood sugar levels. This method is called the “My Plate Method.” My Plate focuses on changing the portion size of the food you eat and include food choices from each of the five food groups (Figure 1).



Figure 1 My Plate Method.

Try these simple steps to get started (Figure 2)

- Using your dinner plate put a line down the middle of the plate so you will have 2 equal sections on your plate.
- Then cut each section into two halves so you will have a total of 4 sections on your whole plate as shown in the picture above.
- Vegetables Group: fill 1/4 of your plate with non-starchy vegetables, such as: spinach, carrots, lettuce, greens, cabbage, green beans (this is starchy vegetable), broccoli, cauliflower, tomatoes, eggplant, zucchini, salsa, onion, cucumber, beets, okra, mushrooms, peppers, turnip.
- Fruit Group: fill 1/4 of your plate with one exchange (one portion) of fruit.
- Grains: about 1/4 of your plate should come from grains. Remember, this is usually about 1/2 to 1 cup of grains.
- Protein Group: about 1/4 of your plate should come from lean meat or meat substitutes such as: one portion of chicken or turkey without the skin, or about 3-4 ounces of fish such as tuna (oil drained or canned in water), salmon, shrimp, lean cuts of beef, veal.

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- Dairy Product: add one cup of non-fat or low-fat milk, Laban (buttermilk) or yogurt.



Figure 2 Glycemic index.

Breakfast: The plate will look different at breakfast but the idea is the same. If you use a plate or bowl for breakfast, keep your portions small. Use half your plate for starchy foods. You can add fruit in the small part and a lean meat such as: eggs or low fat cheese, or meat substitute in the other.

Carbohydrate counting: The total amount of carbohydrates consumed per day is more important than the source of the carbohydrates. Foods that contain carbohydrates raise blood sugar. By keeping track of how many carbohydrates you eat and setting a limit for your maximum amount to eat, you can keep your blood glucose levels in your target range. Your dietitian can help you know how much carbohydrate to eat per day. Divide the total amount of carbohydrates you should eat in a day into 3 meals and 3 snacks.

Food exchange list: It is important to be aware of the carbohydrates content in foods and how to use the below exchange list to enjoy variety of foods and get no more than the recommended daily allowance of carbohydrates. For example, the amounts of carbohydrates in one exchange from milk, bread, fruit and sweets are equivalent. All the below exchange from each food group contain 15gms of carbohydrates. The amount of carbohydrates in meat and fat groups is minimal and maybe neglected (Table 1).

Carefully follow your dietitian's directions about the number of servings to take from each food group and about the timing of meals.

Table 1 Food exchange list

1 exchange= 15 grams carbohydrates		
Add the pictures of:		
Grains	Exchange	<ol style="list-style-type: none"> 1 slice (1 oz.) Whole(no need to specify if its write or whole) Wheat Bread ½ cup Oatmeal 4" dia. Pancake ¾ cup Dry cereal 1/2 cup Pasta 1/3 cup Rice ½ cup of Harees and Jareesh
Starchy Vegetables	Exchange	<ol style="list-style-type: none"> 1/3 cup baked Beans ½ cup Corn ½ cup Peas and lentil Medium (3 oz.) Baked Potato ½ cup Mashed potato
Non-Starchy Vegetables	Exchange=5 grams of carbs	<ol style="list-style-type: none"> ½ cup Asparagus ½ cup Broccoli ½ cup Cauliflower ½ cup Beets ½ cup carrots
Fruits	Exchange	<ol style="list-style-type: none"> 4 oz. Banana ¾ cup Blueberries ¼ melon (11 oz.) Cantaloup 15 medium (3 oz.) Grapes Small orange ¼ cup of dried fruits ½ cup of canned fruits 3 dates ½ cup of unsweetened fruit juice (orange, apple, pineapple or grapefruit juice)
Milk	Exchange	<ol style="list-style-type: none"> 8 oz. whole Milk 8 oz. Skimmed Milk 4 oz. chocolate Milk 6-8 oz. plain yogurt
Protein	No carbs	<ol style="list-style-type: none"> 3 oz. fish or tuna 1 Medium Egg 3 oz. white meat (chicken breast) 3 oz. lean meat (Ground beef) 3 oz. roast beef ¼ cup of cottage cheese
Fats	Little or no carbs	<ol style="list-style-type: none"> 1 tsp Margarine, oil and butter 1 tbspsalad Dressing and Mayonnaise Tbsp cream cheese
Others	Exchange	<ol style="list-style-type: none"> 2" Unfrosted (1 oz.) Brownie Unfrosted 2" (1 oz.) Cookies 1 tbsp Grape Jelly, syrup, jam, sugar and honey ½ cup vanilla Ice Cream 2" square Frosted Yellow Cake (this is equal 2 exchanges)

The two most important factors with carbohydrate counting are: the serving size and the total carbohydrate amount

- Look at the serving size. All the information on the label is about this serving of food. If you will be eating a larger serving, then you will need to double or triple the information on the label.
- Look at the grams of total carbohydrate total carbohydrate on the label includes sugar, starch, and fiber.

Reading food labels

Reading food labels is a great way to know how much carbohydrate is in a food. For foods that do not have a label, you have to estimate how much carbohydrate is in it by using the general serving sizes as explained in the above exchange list.

Other important label information

- If you are trying to lose weight, look at the **calories**. Comparing products can be helpful to find those lower in calories per serving.

A food item with 40kcal or less per serving is considered as low calorie.

- To cut risk of heart disease and stroke, look at saturated and Trans fats and cholesterol. Look for products with the lowest amount of saturated and Trans fats per serving.

A food item with 20mg or less of cholesterol per serving is considered as low cholesterol.

A food item with 2gm or less of saturated fats per serving is considered low in saturated fats.

- For people with high blood pressure, look at the sodium. Look for foods with less sodium.

A food item with 140mg or less of sodium per serving is considered low sodium.

The glycemic index

The glycemic index, or GI, measures how a carbohydrate-containing food raises blood sugar levels. Foods are ranked based on how they compare to glucose. A food with a high GI raises blood glucose faster than a food with a medium or low GI. Meal planning with the GI involves choosing foods that have a low or medium GI. If eating a food with a high GI, you can combine it with low GI foods to help balance the meal. Examples of carbohydrate-containing foods with a low GI include: Dried beans and legumes (like kidney beans and lentils), all non-starchy vegetables and some starchy vegetables, and most fruit. Most of these food items contain fiber which helps lower the GI of a food. Meats and fats don't have a GI because they do not contain carbohydrate, but should be consumed as part of the healthy meal plan and according to the caloric allowance.

What are the factors that can affect the GI of a food?

- Ripeness and storage time – the more ripe a fruit or vegetable is, the higher the GI
- Fiber Content- fiber retards the rate at which the carbohydrate is digested, slower rate of digestion means that the carbohydrate is converted to glucose more slowly, and this leads to a slower increase in blood glucose levels.

c) **Processing:** juice has a higher GI than whole fruit; mashed potato has a higher GI than a whole baked potato, stone ground whole wheat bread has a lower GI than whole wheat bread.

d) **Cooking method:** how long a food is cooked affects the GI. Food becomes soft during prolonged cooking times. This makes the food more easily digestible so that glucose forms and get absorbs into the blood more quickly. Quicker absorption of glucose means a higher glycemic index.

e) **Variety:** converted long-grain white rice has a lower GI than brown rice but short-grain white rice has a higher GI than brown rice, but should consume the same portion size.

f) **Fat and Protein Content:** Fats and proteins slow down the digestion process. The higher the fat and protein content, the lower the glycemic index.

Other things to consider if using the GI

The GI value represents the type of carbohydrate in a food but not the amount of carbohydrate typically eaten. Portion sizes are still relevant for managing blood glucose and for losing or maintaining weight.

Is the GI a better tool than carbohydrate counting?

GI combined with carbohydrate counting, can provide an additional benefit for achieving blood sugar goals for diabetics who can and want to put extra effort into monitoring their food choices. The key to keeping blood glucose levels at your goal is to balance the food you eat with your physical activity and medications. If you eat more carbohydrate than what your body needs, your blood sugar levels will increase. Likewise, if you eat less, but if you eat based on your requirements your blood sugar levels will decrease (Table 2) (Table 3).

Table 2 Diabetic Diet- Sample Menu Plan

Meal	Number of servings	Recommendations
Breakfast		
Low fat/non fat milk		
Fruit		
Bread		
Meat		
Fat		
Morning Snack		
Low fat/non fat milk		
Fruit		
Bread		
Meat (lean)		
Lunch		
Low fat/non fat milk		
Vegetables		
Fruit		
Bread		
Meat (lean)		
Fat		

Table Continued....

Meal	Number of servings	Recommendations
Afternoon Snack		
Low fat/non fat milk		
Fruit		
Bread		
Meat (lean)		
Dinner		
Low fat/non fat milk		
Vegetables		
Fruit		
Bread		
Meat (lean)		
Fat		
Bedtime snack		
Low fat/non fat milk		
Fruit		
Bread		
Meat (lean)		

Table 3 Diet Plan Summary

Food group	Recommended daily allowance/Number of servings per day
Grains	
Vegetables	
Fruit	
Protein	
Milk Products	

Diet plan during ramadan

The general diet guidelines for diabetics are the same during Ramadan. Diabetics should still try to eat three meals, Iftar, mid-time meal or a snack and Suhoor. Use one or combination of the meal planning tools such as My Plate method, Carbohydrate Counting or the Glycemic Index to help you control your diet during Ramadan.

Below are some of the dietetic instructions specific to Ramadan:

- Avoid eating large amounts of foods rich in carbohydrate and fat, especially at Iftar (the sunset meal)
- Eat complex carbohydrates at Suhoor (predawn meal) because they take more time in digestion and absorption so they help you to feel full and prevent a sudden drop in the blood sugar levels.
- Simple carbohydrates are more appropriate at Iftar (the sunset meal) to elevate blood glucose level rapidly which is usually low at Iftar time.
- Drink plenty of fluids during between Iftar and Suhoor to avoid dehydration which can lead to low blood sugar (hypoglycemia). Avoid drinking caffeinated drinks because they can cause loss of fluids, leading to dehydration.
- Eat Suhoor (predawn meal) as late as possible before the start of the daily fast.
- Fasting diabetics who are on pills or insulin are advised to avoid exercises during the daytime especially in the afternoon (to avoid hypoglycemia). Patients may exercise (walking) 1-2 hours after Iftar meal for 30minutes with physician approval.

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Conflict of interest

Author declares that there is no conflict of interest.