

## DIABETES: CARBOHYDRATE COUNTING

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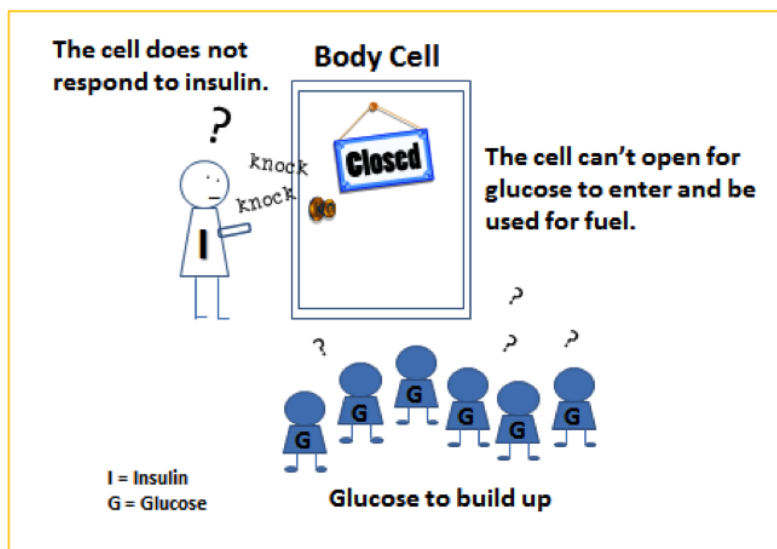


Figure: Diabetes, hyperglycemia

### What is diabetes?

Diabetes — is a disease that your blood glucose, also called blood sugar, is too high. Your body needs glucose for energy to keep you going. But having too much glucose in the blood can be unhealthy. Glucose comes from foods that contain carbohydrates, and the body can make it from other substances and stored inside the body. Your blood carries the glucose to all of the cells in your body. Insulin is a chemical (hormone) made by an organ called the pancreas that lies near the stomach and helps the glucose get into the cells of your body for energy. People with diabetes don't make enough insulin or the body cells do not respond to insulin, causing glucose to build up in the blood. (See Figure: Diabetes, hyperglycemia (hi-per-gly-see-me-uh) – high blood glucose levels)

### Why do you need to control your blood glucose level?

If your blood glucose stays too high overtime, it can damage blood vessels and cause heart attacks or strokes. Constant high blood glucose can also cause blindness, kidney failure, and loss of toes, feet, or teeth because of poor blood flow and nerve damages. Diabetes causes more deaths per year than breast cancer and AIDS combined. Two out of three people with diabetes die from heart disease or stroke. (1, 2) The good

news is that when you control your blood glucose within the target range, you can reduce or avoid these problems.

### How can I control my blood glucose level?

The key to taking care of your diabetes is to keep your blood glucose as close to normal levels as possible. Carb (carbohydrate) counting is a way to help you eat the right amounts of food, so you can manage your blood glucose levels.

### What is carb (carbohydrate) counting?

Carb counting is a meal planning approach for people with diabetes. Carb counting involves adding up the amount of carbohydrates (grams\*) in your food. Spreading the right number of carbohydrate intake throughout the day helps prevent high blood glucose after eating.

You can use carb counting books that describe portions of carbs in foods or use Carb Counting Table. (see the Tables below)

\*"Grams" is a unit of weight like pounds or ounces. Abbreviation for the gram is g. One gram equals 0.035oz, about weight of one paper clip.



## Basics of Carbohydrate Counting: Step 1-2-3

### Step 1: Know your carb limit

It is important to know that everyone needs a different amount of carbs. The amount that is best for you depends on several factors, such as your age, weight, level of physical activity, and current blood glucose level. Typically, most people start off with 45 to 60g of carbs at each meal and 15 to 30g for snacks. If your blood glucose goes too high, you may need to eat a smaller amount of carbs.

Your doctor, registered dietitian, or diabetes educator can help you determine the amounts that will be best for you.

### Step 2: Count your carbs

Foods that contain carbs include:

- Fruits, fruit juices (or any food that contains fruit or fruit juices)
- Milk, ice cream, and yogurt
- Starchy foods (such as breads, pastas, cereals, dry beans, and vegetables such as potatoes and corn)
- Sweets (such as cake, candy, cookies, pie) and sugary foods (regular soda, fruit drinks)

The carb content of these foods can be determined by food labels, nutrition books, software or carb count app, a measuring cup or a scale.

“**Carb Counting Tables**” can help you determining the total grams (g) of carbs you are eating or how many carbs (g) in your foods. You may also need measuring cups and spoons to determine serving size of the foods.

### How to use “Carb Counting Tables”

Each food portion listed in the Carb Counting Tables contains about 15 g of carbs and counts as one carb serving, unless noted otherwise. If what you eat varies or food labels on your food are different size from the Carb Counting Table, you may need to measure actual serving sizes.

Here are some examples

### How many carbs are in these meals?

#### Meal 1:

2 eggs, 1 English muffin with cream cheese, 1 cup of milk, and a banana

Answer: 75g = 5 counts x 15g: the English muffin is 30 g (2 counts x 15g portions), the banana is 30g (2 counts x 15g portions), the cup of milk is 15g (1 count x 15g portion), and the cream cheese and eggs don't have carbohydrates (0 g of carbs)

#### Meal 2:

1 sandwich with Turkey, mayo, lettuce, onion, and tomato with 1 small bag of potato chips

Answer: 45g = 3 counts x 15g: the 2 slices of bread are 30g of carbs (2 counts x 15g choices), the small bag of potato chips is 15g of carbs (1 count x 15g choice), the turkey and mayo don't have carbohydrates, and the lettuce, onion, and tomato are free foods

#### Meal 3:

1 small salad (mixed greens, tomato, onion, cucumber) with vinaigrette dressing, baked chicken, ½ cup of mashed potatoes

Answer: 15g = 1 count x 15g: the ½ cup of mashed potatoes is 15g (1 count x 15g choice), the salad ingredients are all free foods, and the baked chicken and vinaigrette dressing don't have carbohydrates.

### Step 3: Check how you are doing

Check your blood glucose and make sure you are within your target range. (Note: blood sugar targets vary from person to person and can even vary in the same person over time.) Your doctor can determine your target range and will teach you how to check your blood glucose with a glucose meter.

Food containing carbohydrate raises your blood glucose. Diabetes medications, insulin (hormone) or being physically active will lower your blood glucose. If you feel any symptoms of high glucose (examples, increased thirst, frequent urination) or low blood glucose (examples, sweating and chills, shakiness), use your blood glucose meter.

### Things to Remember:

Try to eat 3 meals a day with a consistent amount of carbs. Great carb choices include whole grain foods, nonfat or low-fat milk, and fresh fruits and vegetables. Carbohydrate foods that are naturally high in fiber are good choices. You can take control of your diabetes, instead of letting it control you.

## References:

1. Diabetes Basics, Diabetes Myths. American Diabetes Association. <http://www.diabetes.org/diabetes-basics/diabetes-myths/>
2. Misner S., Cutis C, Whitmer E. (2008) Diabetes – Meal Planning, The First Step. [AZ 1228 -Revised]. Tucson, AZ: University of Arizona Cooperative Extension. Online: <http://cals.arizona.edu/pubs/health/az1228.pdf>
3. Food-A-Pedia. SuperTracker (USDA) <https://www.supertracker.usda.gov/#home>

## Abstract:

Carbohydrate counting is a meal planning approach for people with diabetes to manage their blood glucose levels. Controlling blood glucose is a way to prevent diabetes complications such as heart disease, bone and joint disorders, skin and digestive problems, and problems with teeth and gums. This article gives an idea how to count carb using carb counting tables, which show various portions of foods that are equal to one carbohydrate counting =15g of carbohydrate.

Table 1a: Carb Counting Table – Starchy Carbohydrates (Each of these portions is equal to one carbohydrate counting =15g of carbohydrate)

Starchy Carbohydrates	15gm Portions
Bagel (1 oz.)	¼ to ½ bagel
Baked Potato	½ medium
Beans or Peas:	½ cup cooked
Bread	1 slice
Cereal	¾ cup
Hot Cereal	½ cup
Chips (Potato or Corn) or Thin Fries	12 chips
Corn	½ cup or 6" corn on a cob
English Muffin	½ of muffin
Flour, Bread Crumbs, or Cornmeal:	3 tablespoons
Graham Cracker Squares	3 crackers
Hamburger or Hotdog Bun	½ bun
Mashed Potato	½ cup
Oyster Crackers	24 crackers
Pancakes	1- 3" Diameter
Pizza (Thin Crusted)	1/8 -12" pizza
Pop Corn	3 cups
Pretzel (Mini)	12 mini
Rice or Noodles	1/3 cup cooked
Saltines	6 saltines
Soup	1 cup
Spaghetti Sauce	½ cup
Sweet Potato	½ cup
Tortilla	1 - 6"

Please note: Different food brands could be varying in portion sizes. Check food labels or use Food-A-Pedia (3) to find carbohydrate (g) in your foods.

Table 1b: Carb Counting Table – Fruit Carbohydrates (Each of these portions is equal to one carbohydrate counting =15g of carbohydrate)

Fruit Carbohydrates	15gm Portions
Apple or Orange	1 medium (size of tennis ball)
Apple Sauce (Unsweetened)	½ cup
Banana	½ banana
Blue or Blackberries	¾ cup
Cantaloupe or Honeydew	1 cup
Cherries	12 cherries
Cranberry Juice Cocktail	1/3 cup
Fruit in Juice (Canned)	½ cup
Grapes	12 large grapes
Grape Juice	1/3 cup
Grapefruit	½ cup
Mango	½ cup
Orange, Apple, or Pineapple Juice	½ cup
Papaya	1 cup
Peach or Nectarine	1 medium (size of tennis ball)
Pear or Kiwi	1 medium pear or kiwi
Pineapple	2 slices
Prunes	3 prunes
Raisins	2 tablespoons
Raspberries	1 cup
Strawberries	1 ¼ cups
Watermelon	1 ¼ cup

Please note: Different food brands could be varying in portion sizes. Check food labels or use Food-A-Pedia (3) to find carbohydrate (g) in your foods.

Table 1c: Carb Counting Table – Dairy Carbohydrates (Each of these portions is equal to one carbohydrate counting =15g of carbohydrate)

Dairy Carbohydrate	15gm Portions
Milk (whole milk, 2%, 1% or skim milk)	1 cup
Chocolate milk (whole milk or skim milk)	½ cup
Ice cream	1 medium scoop
Blueberry yogurt, low fat	½ cup (6-oz)
Yogurt, light (fat free, low calories sweetener)	1 cup (6-oz)

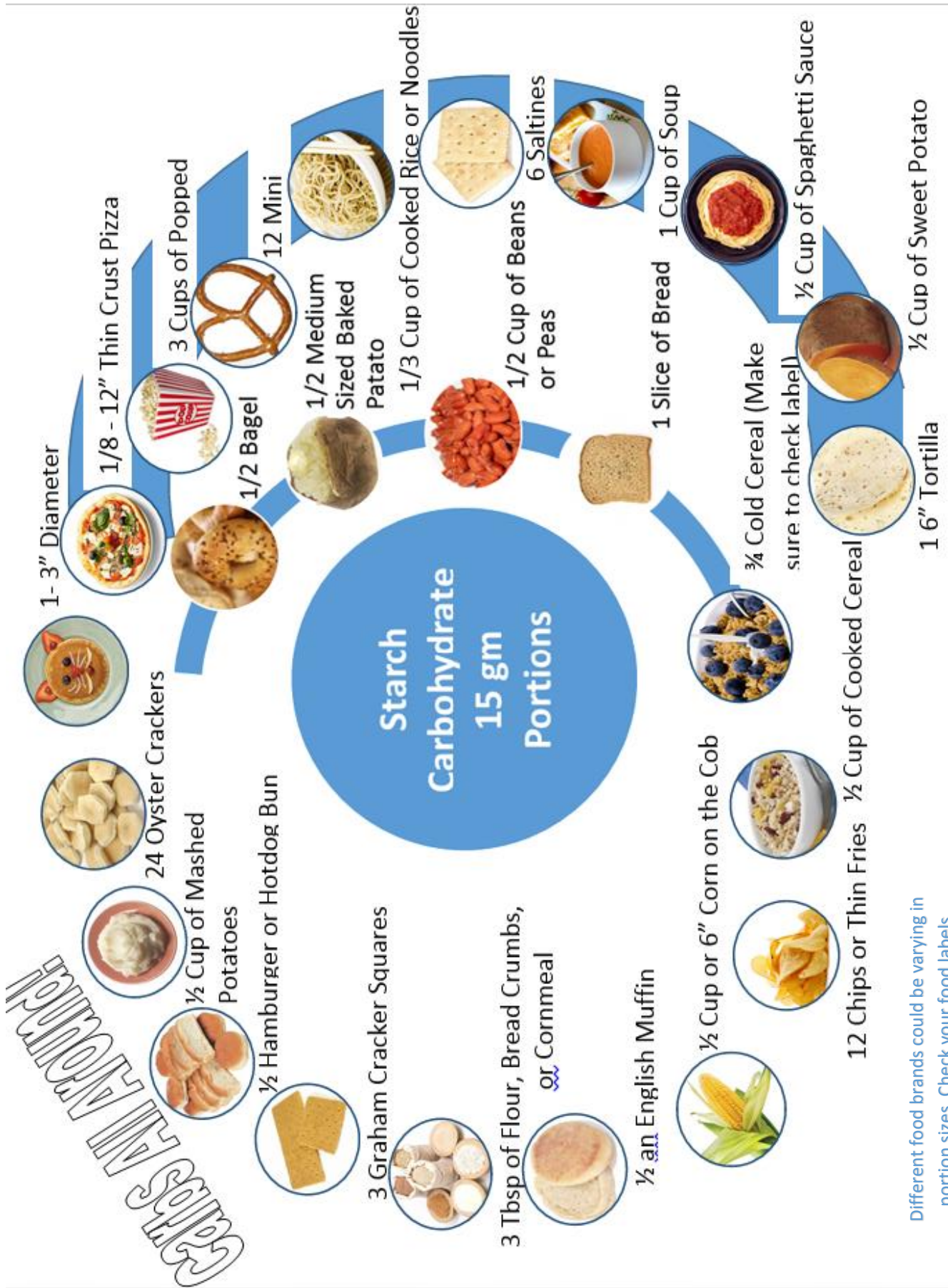
Please note: Different food brands could be varying in portion sizes. Check food labels or use Food-A-Pedia (3) to find carbohydrate (g) in your foods.

Table 1d: Carb Counting Table – Sweets Carbohydrates (Each of these portions is equal to one carbohydrate counting =15g of carbohydrate)

Sweets Carbohydrate	15gm Portions
BBQ sauce	3 tablespoons
Brownie (no icing)	1 ¼" square
Cookies, butter or sugar cookie	1 and ½ medium (2-5/8" across)
Doughnut (glazed or powder sugar)	1 small (2-1/2" across)
Ketchup	4 tablespoons
Soft drink, cola, regular	5 fluid ounces
Sugar, white	3-3/4 teaspoons
Syrup (regular)	1 tablespoon
Syrup, pancake, reduced calories (Lite syrup)	2 tablespoons
Vanilla wafer (Nilla wafer)	5 medium

Please note: Different food brands could be varying in portion sizes. Check food labels or use Food-A-Pedia (3) to find carbohydrate (g) in your foods.

# Appendix 1



Different food brands could be varying in portion sizes. Check your food labels.

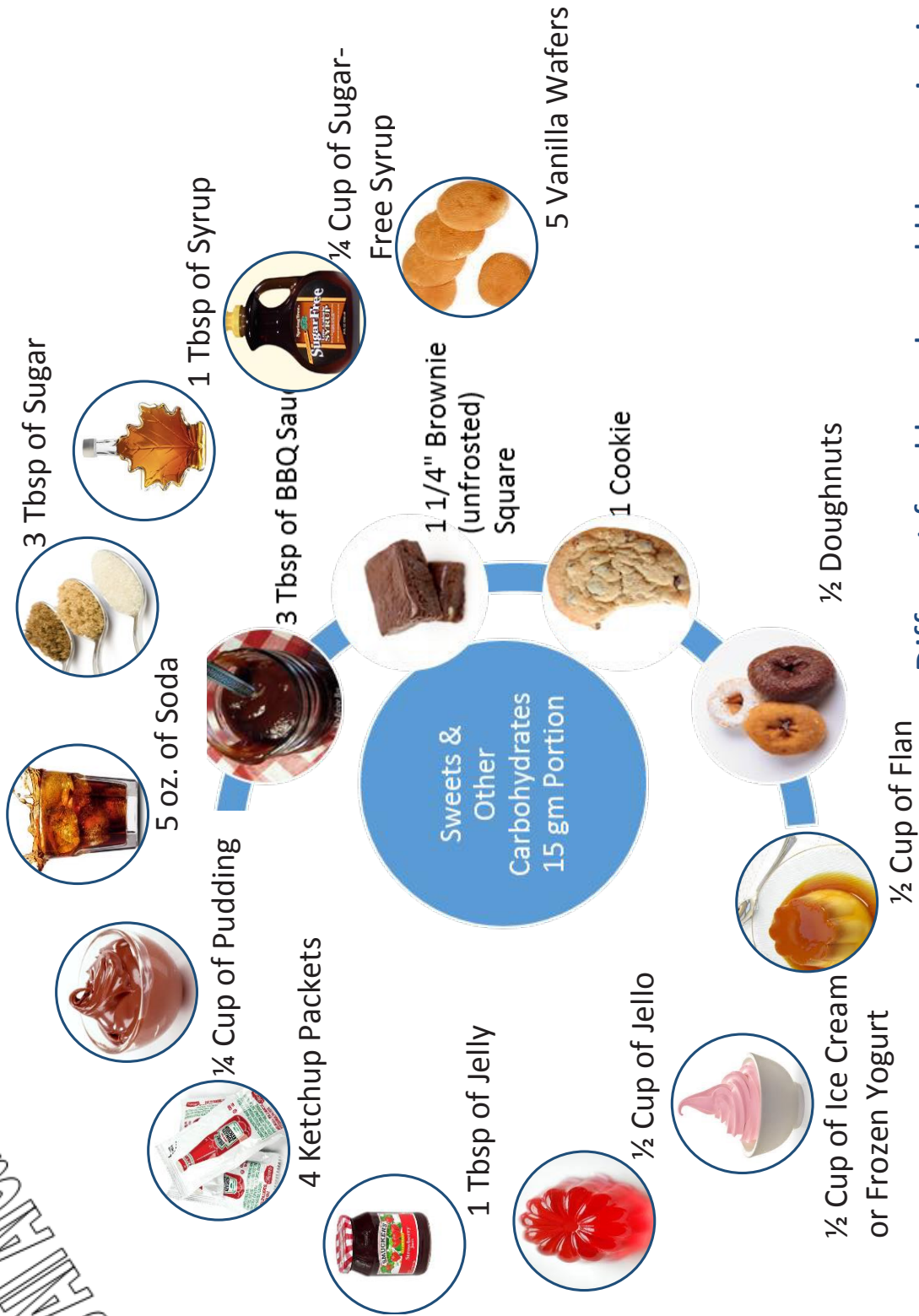
# Carbs All Around

Different food brands could be varying in portion sizes. Check your food labels.



### Appendix 3

Carbohydrate



Different food brands could be varying in portion sizes. Check your food labels.

# Appendix 4

## KEY FOR PORTIONS

Cupped Hand = 1 Serving of Cereal or Grain

Closed Fist = 1 Serving of Fruits and Vegetables

1 Tennis Ball = Medium Size Fruit

Open Palm = 1 Serving of Meat

Two Fingers' Width and Height = 1 Serving of Cheese

Tip of Thumb = 1 Serving of Oil or Salad Dressing

Thumb = 1 Serving of Candy





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