

Carbohydrate Counting and Beyond

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Carbohydrate

- The nutrient with the MOST effect on raising blood sugar levels
- The nutrient that readily supplies our body with energy
- The nutrient that creates energy stores (glycogen) in muscle and liver
- Comes from starches and sugars

Macronutrient - carbohydrate

Grains	Legumes and starchy vegetables	Fruit	Dairy	Sweets
Bread	Beans	Fresh fruit	Milk	Cake
Pasta	Lentils	Frozen fruit	Yogurt	Cookies
Rice	Sweet potato	Dried fruit		Candy
Crackers	Potato	Fruit juice		Pie
Quinoa	Corn			Pastries
Oatmeal	Peas			
Cereal	Butternut squash			
Pancakes	Acorn squash			
Chips	Pumpkin			
Tortillas				

Macronutrient - protein

Meats	Dairy	Vegetarian
Poultry	Cheese	Tofu
Pork	Cottage cheese	Tempeh
Red meat	Plain Greek yogurt	Seitan
Fish		Edamame
Game		Soy protein products
Eggs		

Macronutrient - fat

Fats
Oil
Butter
Avocado
Olives
Nuts
Seeds

Carb counts in common foods

Food	Amount	Carbohydrate amount (grams)
Oatmeal	½ cup cooked	13
Bagel	Large (4 oz)	57
Bread	1 large slice (1.5 oz)	18
	Sandwich slice (1 oz)	12
Rice	1 cup short grain (7.2 oz)	59
	1 cup long grain (5.5 oz)	44
Pasta	1 cup cooked spaghetti	44
Banana	Large (8 inches)	30
Mashed potato	½ cup	18
Potato	Medium (8 oz)	40
Beans	½ cup cooked	21

Macronutrients and impact on blood glucose

- Carbohydrate – rise in glucose



- Protein – little rise in glucose



- Fat – little rise in glucose. BUT, too much can cause late post-prandial hyperglycemia when consumed with carbs. More on this later....



Carbohydrate counting

- Carbohydrate consistency when on a fixed insulin regimen
- Carbohydrate freedom when using an insulin to carb ratio

Carbohydrate counting

- Tools needed for carb counting: food scale, measuring cups, measuring spoons, food label or other resource to look up carb content



- Measure foods until you have trained your eyes to estimate accurately

Label reading

- 1) Identify portion size
- 2) Identify total carbohydrate

Nutrition Facts			
Serving Size 1 cup (228g)			
Servings Per Container 2			
Amount Per Serving			
Calories 260		Calories from Fat 120	
		% Daily Value*	
Total Fat 13g			20%
Saturated Fat 5g			25%
Trans Fat 2g			
Cholesterol 30mg			10%
Sodium 660mg			28%
Total Carbohydrate 31g			10%
Dietary Fiber 0g			0%
Sugars 5g			
Protein 5g			
Vitamin A 4%	•	Vitamin C 2%	
Calcium 15%	•	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	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9	•	Carbohydrate 4	• Protein 4

Other considerations

- 1) Fiber content.
Subtract half or all?
- 2) Sugar alcohols.
Subtract half.
- 3) Fat content. May need to make additional adjustments if >20 grams

Nutrition Facts	
Serv. Size 1 Bar (60g)	
Amount Per Serving	
Calories 220 Fat Cal. 90	
% Daily Value*	
Total Fat 10g	15%
Saturated Fat 7g	35%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 330mg	14%
Potassium 125mg	4%
Total Carbohydrate 32g	11%
Dietary Fiber 14g	56%
Sugars 1g	
Sugar Alcohols 15g	
Protein 14g	25%
Vitamin A 15% • Vitamin C 15%	
Calcium 4% • Iron 20%	
Vitamin E 10% • Vitamin K 10%	
Thiamin 10% • Riboflavin 10%	
Niacin 10% • Vitamin B6 10%	
Folate 10% • Vitamin B12 10%	
Biotin 10% • Pantothenic Acid 10%	
Phosphorus 15% • Magnesium 6%	
Zinc 10%	

*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
Saturated Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2,400mg
Potassium	3,500mg	3,500mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g
Protein	50g	65g

★

★ Sugar Alcohols total includes 9g of glycerin.

INGREDIENTS: CHOCOLATE FLAVORED COATING (PALM KERNEL OIL, POLYDEXTROSE, MALTITOL, WHEY PROTEIN CONCENTRATE, COCOA POWDER (PROCESSED WITH ALKALI), WHOLE MILK POWDER, SOY LECITHIN, SALT, NATURAL AND ARTIFICIAL FLAVOR, SUCRALOSE, ACESULFAME POTASSIUM), SOY PROTEIN ISOLATE, POLYDEXTROSE, GLYCERIN, CHOCOLATE CHIPS (MALTITOL, UNSWEETENED CHOCOLATE (PROCESSED WITH ALKALI), COCOA BUTTER, SOY LECITHIN, VANILLA EXTRACT), PALM OIL, WATER, HYDROLYZED GELATIN, CANOLA OIL, NATURAL AND ARTIFICIAL FLAVORS, SALT, SOY LECITHIN, VITAMIN MINERAL MIX (MAGNESIUM OXIDE, SODIUM ASCORBATE, ASCORBIC ACID (VITAMIN C), DL-ALPHA-TOCOPHERYL ACETATE (VITAMIN E), NIACINAMIDE, ZINC OXIDE, D-CALCIUM PANTOTHENATE, VITAMIN A PALMITATE, THIAMIN MONONITRATE, PYRIDOXINE HYDROCHLORIDE (VITAMIN B6), RIBOFLAVIN (VITAMIN B2), FOLIC ACID, BIOTIN, PHYLLQUINONE (VITAMIN K1), CYANOCOBALAMIN (VITAMIN B12)), SUCRALOSE, ACESULFAME POTASSIUM. FRO2

CONTAINS MILK AND SOY.
THIS PRODUCT IS MANUFACTURED IN A FACILITY THAT USES PEANUTS, TREE NUTS, EGGS, WHEAT AND SESAME SEEDS.

Do the math

- 1) 32 g carbohydrate
 - 7 g from fiber (subtract half)
 - 7.5 g from sugar alcohols (subtract half)

= bolus for 17.5 g carbohydrate

- 2) 32 g carbohydrate
 - 14 g from fiber (subtract all)
 - 7.5 g from sugar alcohols (subtract half)

= bolus for 10.5 g carbohydrate

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Sugar Alcohols 15g	
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Vitamin E 10%	Vitamin K 10%
Thiamin 10%	Riboflavin 10%
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Folate 10%	Vitamin B12 10%
Biotin 10%	Pantothenic Acid 10%
Phosphorus 15%	Magnesium 6%
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What happens when you add fat to a meal

- Delayed gastric emptying
- Insulin resistance
- Delayed in peak blood sugar
- Possible hypoglycemia soon after meal
- Too much can cause high blood sugar 3+ hours after the meal

Modifications for dietary fats

- Keep meals relatively low in fat and choose healthy fats (olive oil, nuts, seeds, avocado)
- When having a meal that is high in fat >20 grams and high in carbs (pizza, Chinese food) or high in protein and fat with carbs (6 oz burger on bun with fries), consider using a dual/combo bolus

Ex. 50% of bolus as normal wave, 50% of bolus as square wave over 2-3 hours (discuss with your endocrinologist or CDE to determine what dual wave settings are best for you)



Overall healthy diet

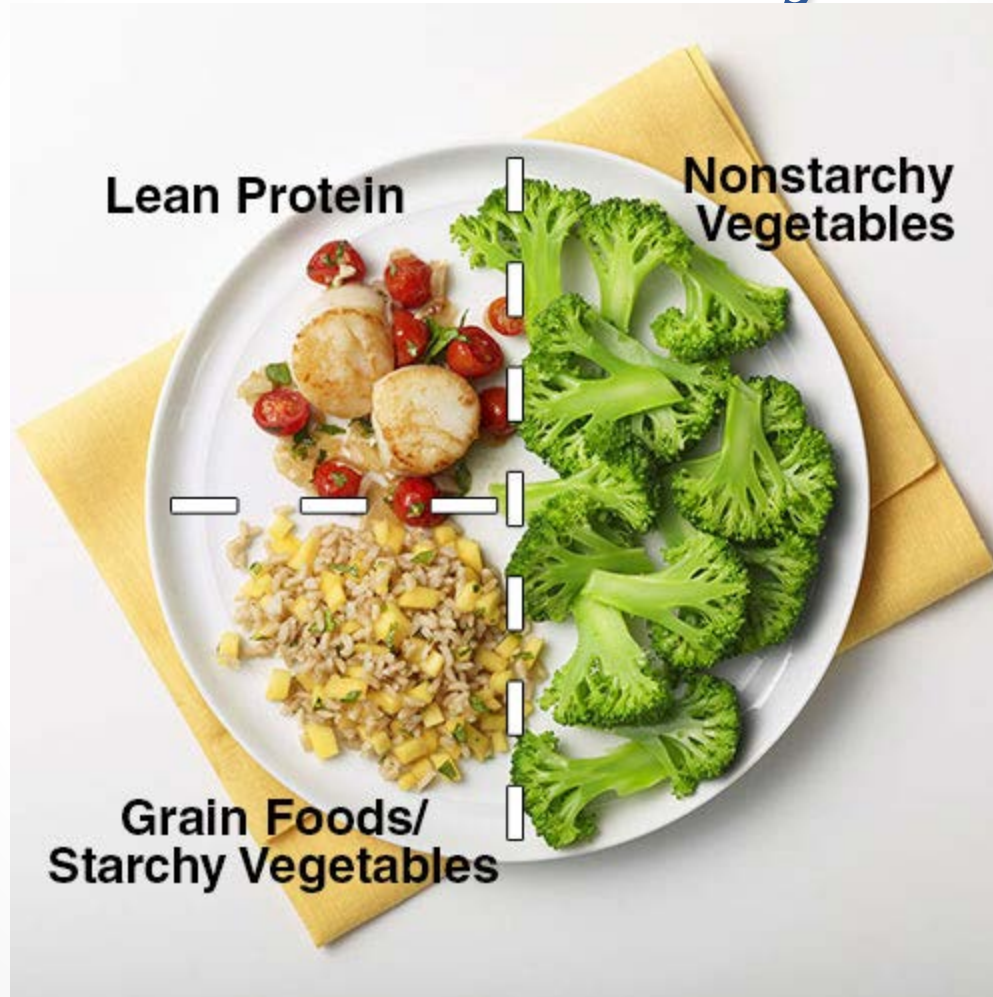


Photo: Diabetes Forecast. November 2015

Plate method at breakfast?

Breakfast combinations:

Eggs and Fruit

Eggs and sprouted bread

Eggs and smoked salmon on a sprouted english muffin

Cottage cheese and fruit

Yogurt

Greek yogurt and fruit

Protein breakfasts requiring little or no bolus:

Omlette with cheddar and broccoli

Cottage cheese and pumpkin seeds

Hard boiled eggs and turkey bacon

Turkey and cheese roll ups



Dealing with alcohol

- Limit 1-2 servings (a serving is 5oz wine, 12oz beer, 1 oz liquor)
- Plan on eating a 15 gram carbohydrate snack with each serving and do NOT bolus (or have drink(s) with a meal).

If you are going to drink more than is recommended:

- Have a designated sober friend with you that knows about your diabetes
- Check your blood sugar at bedtime AND set your pump for an 85% temporary basal rate for 8 hours to help prevent overnight hypoglycemia.
- Get up by 9am the next morning to check your blood sugar and eat breakfast (then you can go back to bed).
- Beverages that have a "sugary mix" (ie daiquiris, margaritas, drinks mixed with regular soda, etc) do need a bolus (usually best to bolus for only about 1/2 of the carbs as alcohol can have a delayed blood sugar lowering effect).



Exercise

- Aerobic exercise lowers blood glucose by using the glucose in your blood stream
- Consider decreasing preceding meal bolus and suspending pump during exercise or using a temp basal
- High intensity, vigorous exercise can temporarily raise your blood glucose immediately after exercise
- It is recommended that you fuel with carbohydrate when exercise duration lasts longer than 90 min
- Bolusing for carbohydrate intake during exercise must be individualized
- Excarbs.com is a great resource

