Nutrition Facts

Serving Size 1 cup (85g) (3 oz.)

Servings per container 2.5

Amount per serving

Calories 45 Calories from Fat 0

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 55 mg	2%
Total Carbohydrate 10g	3%
Dietary Fiber 3g	12%
Sugars 5g	
Protein 1g	

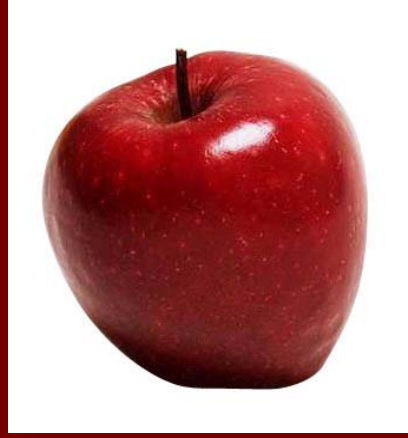
Vitamin A 360% • Vitamin C 8% • Calcium 2% • Iron 0%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily value 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	Less than	300mg	375mg
Dietary Fiber	Less than	25g	30g

Calories per gram: Fat 9 • Carbohydrate 4 • Protein 4

Ingredients: Carrots.



Carbohydrate Counting for Patients With Diabetes

Review Date 4/08 D-0503

Program Objectives

At the end of the session you will know how to:

- Define carbohydrate counting
- Identify the relationship between carbohydrates and blood sugar
- Determine the grams of carbohydrate in foods when using the nutritional food label and other carbohydrate-counting tools
- Calculate the total grams of carbohydrate/meal

Relationship Between Carbohydrate and Blood Sugar

- The digestive system converts most digestible carbohydrates into glucose (also known as blood sugar)
- Cells are designed to use this as a universal energy source
- As blood sugar levels rise in a nondiabetic individual, beta cells in the pancreas churn out more and more insulin, a hormone that signals cells to absorb blood sugar for energy or storage

Carbohydrate and Blood Sugar in Diabetes

- Individuals with type 1 diabetes—the pancreas does not make any insulin so their cells can't absorb sugar
- Individuals with type 2 diabetes—the pancreas does not make enough insulin or the insulin is not effective because the cells are insulin resistant
- Carbohydrates begin to raise blood glucose within approximately 5 minutes after initiation of food intake
- Carbohydrates are converted to nearly 100% blood glucose within about 2 hours

Carbohydrate and Blood Sugar in Diabetes

- The focus of carbohydrate counting is on the 1 nutrient that most impacts blood glucose
- Carbohydrate is the primary nutrient affecting blood glucose levels
- Individuals can learn to relate carbohydrate intake with their blood glucose results

Carbohydrate and Blood

Blood Sugar Target Ranges

- Fasting/before meals: 90-130 mg/dL
- After meals (2 hours after first bite): <180 mg/dL or 30-50 mg/dL increase from premeal to postmeal

Carbohydrate and Blood Sugar in Diabetes—Example

- Mr. S consumed 90 g of carbohydrate for breakfast (day 1)
  - Blood sugar premeal = 115 mg/dL
  - Blood sugar postmeal = 205 mg/dL
- Mr. S consumed 45 g of carbohydrate for breakfast (day 2)
  - Blood sugar premeal = 125 mg/dL
  - Blood sugar postmeal = 150 mg/dL

Carbohydrate (CHO) Counting Defined

- A meal-planning approach for all patients with diabetes, based on the following ideas:
  - Carbohydrate is the main nutrient affecting postprandial glycemic response
  - Total amount of carbohydrates consumed is more important than the source of carbohydrates

Benefits of Carbohydrate Counting

- More flexible than other meal-planning methods
- Sugar is not forbidden
- Focuses attention on the foods that are most likely to make blood glucose levels go up

Foods That Contain Carbohydrates

- Breads, cereals, pasta, and grains
- Rice, beans, and starchy vegetables (potatoes, corn, peas)
- Fruit and fruit juices
- Milk and yogurt
- Regular soda, fruit drinks, jelly beans, and gum drops
- Cakes, cookies, and chocolate candy

Follow these rules:

- 2 to 3 servings of nonstarchy vegetables
- 2 servings of fruit
- 6 servings of grains, beans, and starchy vegetables
- 2 servings of low-fat or fat-free milk
- About 6 oz of meat or meat substitutes
- Small amounts of fat and sugar

* Page 2 in your book “Choose your Foods”

IMPORTANT!

- Eat meals at the same times
- Never skip meals
- Eat 3 meals a day and healthy snacks between meals
- Your goal is 45 – 60 g of carbohydrates per meal
- This method focuses on counting carbohydrates
- It doesn’t mean that you can eat as much foods as you want from groups that don’t contain any carbohydrates!

Grams of Carbohydrate (per Food Category)

- **Starch** 1 serving equals about 15 g carbohydrate
- **Fruit:** 1 serving equals about 15 g carbohydrate
- **Milk:** 1 serving equals about 12 g carbohydrate
- **Nonstarchy Vegetables:** 1 serving equals about 5 g carbohydrate

* Open your book on page 4

Starches

Starch Group

Each amount listed below = 15 g carbohydrate
1 oz of bagel, bread, roll (1 slice of bread, one fourth of a bagel)
¾ C unsweetened cereal (Cheerios®, Rice Krispies®, corn flakes)
⅓ C higher-carbohydrate cereals (raisin bran)
One half of an English muffin
⅓ C cooked pasta, spaghetti, macaroni and cheese
⅓ C cooked brown or white rice
½ C mashed potatoes
½ C corn, beans, chickpeas, peas
1 small baked potato (3 oz)

Important things to know about starch group

- 6 exchange choices from this group are preferred
- Remember that fiber is a type of complex carbohydrate
- Make sure that half of your 6 exchanges are whole grain
- It is easy to spot high fiber foods in your book. They have a smiley face next to them

Fruits and Fruit Juices

Fruit Group

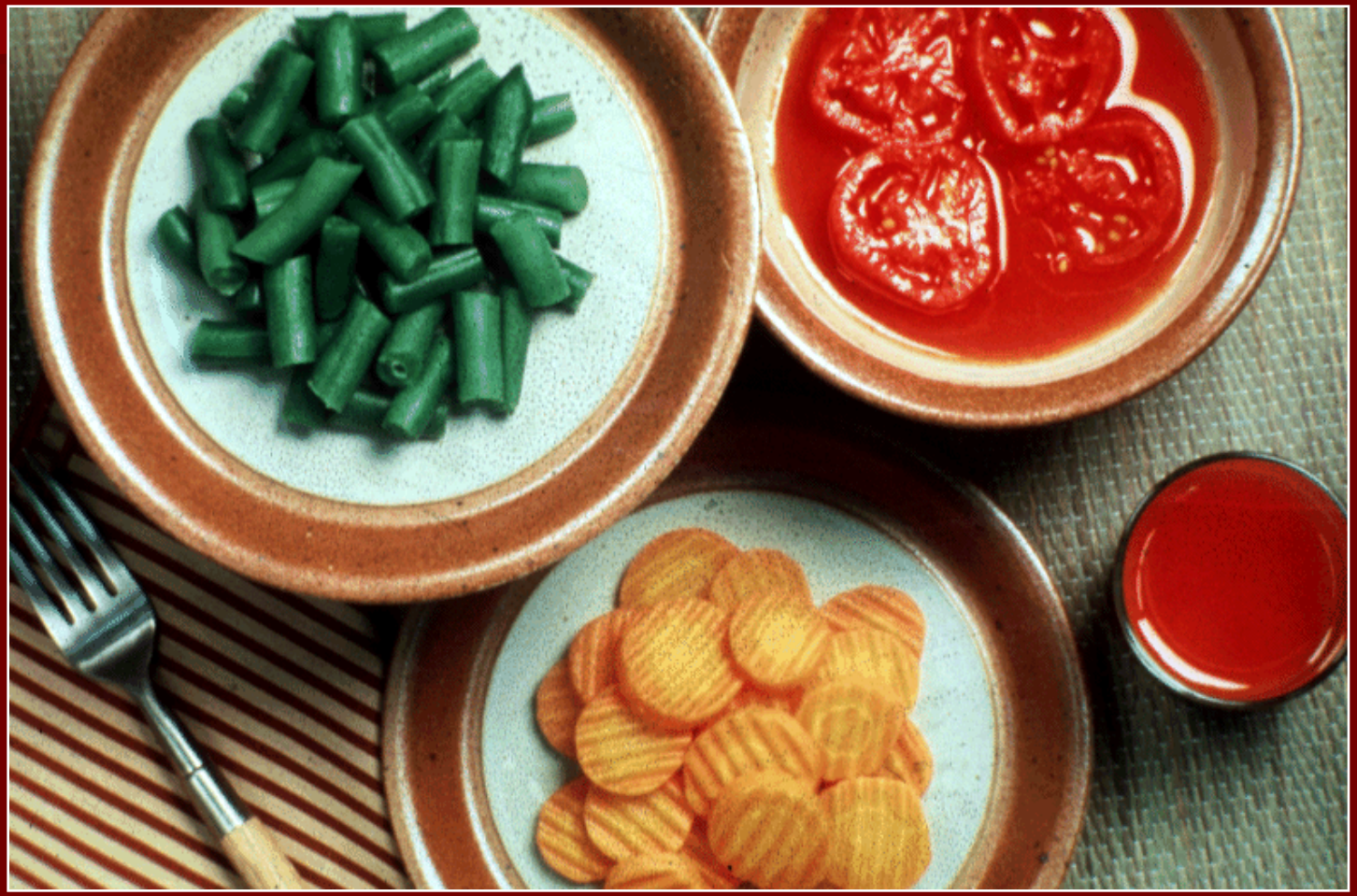
Each amount listed below = 15 g carbohydrate
1 small fresh fruit (4 oz)
½ C canned fruit (in natural juice)
2 Tbsp raisins
17 grapes
½ C fruit juice
1 C fresh fruit (cut up)
1 Tbsp jelly, jam

Milk and Yogurt

Milk Group

Each amount listed below=approximately 12 g carbohydrate
8 fl oz of skim, 1%, 2%, or whole milk
1 C plain yogurt
1 C plain or vanilla soy milk

Vegetables



Vegetables

Vegetables are counted as 5 g carbohydrate for the following servings sizes:

- ½ C cooked vegetables
- 1 C raw vegetables

Foods Without Carbohydrate

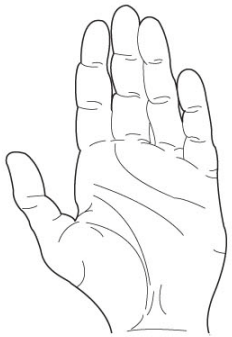
Protein and fat groups contain 0 g carbohydrate

Examples:

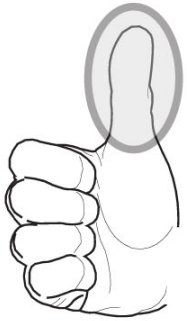
- **Protein:** Meat, fish, poultry, cheese, eggs, peanut butter, cottage cheese, tofu
- **Fat:** Butter, oils, margarine, mayonnaise, cream cheese, sour cream, nuts, seeds, avocado, salad dressing

Carbohydrate Counting Hand Guide

Fist = 8 fluid oz or 1 cup



Palm = 3 oz.



Thumb = 1 oz.

Handful = 1/2 cup

Thumb tip = 1 tsp.

Tools for Carbohydrate Counting

Nutrition Labels

Nutrition Facts
Serving Size 2 crackers (14 g)
Servings Per Container About 21

Amount Per Serving	
Calories 60 Calories from Fat 15	
	% Daily Value*
Total Fat 1.5g	2%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 70mg	3%
Total Carbohydrate 10g	3%
Dietary Fiber Less than 1g	3%
Sugars 0g	
Protein 2g	

Vitamin A 0% • Vitamin C 0%
Calcium 0% • Iron 2%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

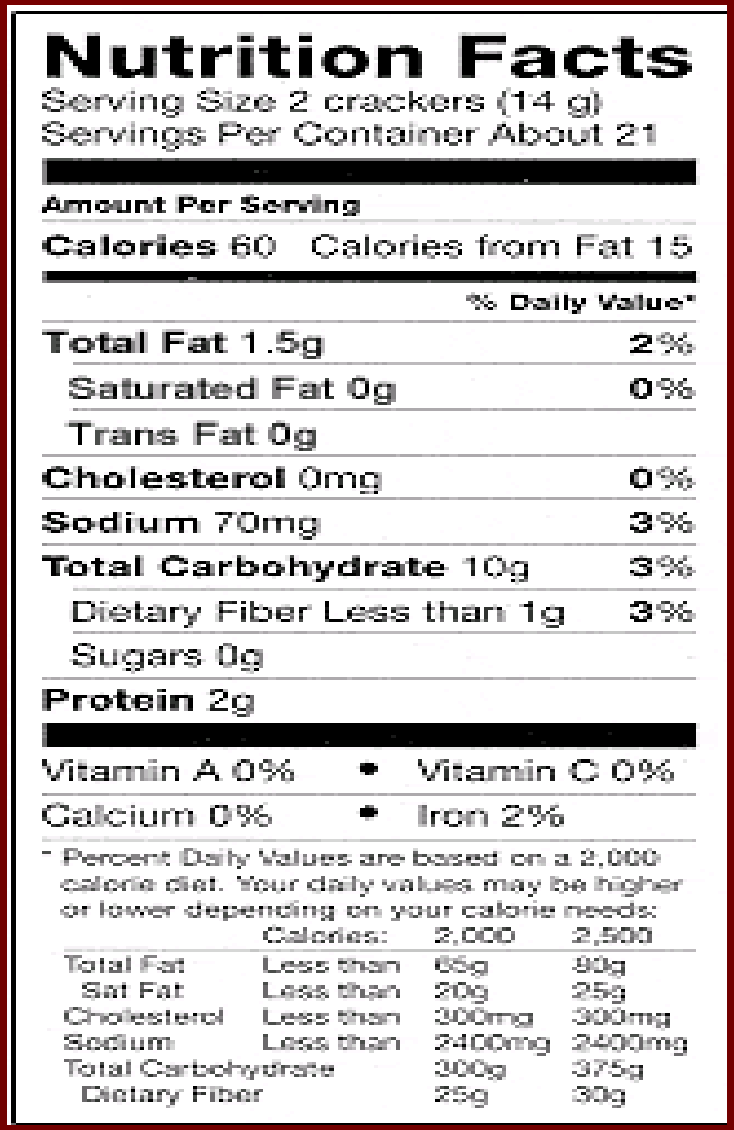
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Measuring Tools

Food Labels

Total Carbohydrate—**includes grams of sugar, sugar alcohol, starch, and dietary fiber**

Total Grams of Carbohydrate—**to determine amount of carbohydrate eaten, multiply grams of total carbohydrates on the label by the number of servings eaten**



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Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Carbohydrate Substituting

- When carbohydrate counting, it is possible to substitute 1 food item for another for a similar impact on blood glucose
- Example: Exchange 1 small apple (4 oz) for 2 small cookies for a similar effect on blood glucose

Carbohydrate Allowances for Meals and Snacks

- Patients with diabetes should work with a registered dietitian or certified diabetes educator to receive an individualized meal plan, which includes how many total carbohydrates they should consume at meals and snacks
- A general guideline for patients is 45-60 g/meal and 15-30 g/snack

Sample Menu Breakfast

How many carbohydrates are in this meal?

1½ C of Cheerios=

Small banana (4 oz)=

8-fl-oz 1% milk=

1 egg=

TOTAL=

Sample Menu Lunch

How many carbohydrates are in this meal?

2 slices of bread=

17 grapes=

1 C raw carrots=

3 oz tuna fish=

1 tsp mayonnaise=

Sample Menu Dinner

How many carbohydrates are in this meal?

1 ½ C pasta=

1 oz of bread=

1 C salad =

1 tsp olive oil=

Total =

Conclusions

- Carbohydrate counting is a meal-planning approach to help people with diabetes attain and maintain blood sugar control
- Carbohydrate counting provides flexibility and helps people increase their confidence to manage diabetes
- Patients should consult a registered dietitian or certified diabetes educator to help them master carbohydrate-counting skills

References

- Thomas E. Survey reveals shortfall in pediatric nurses' knowledge of diabetes. *J Diabetes Nurs*. 2004;8:217-221.
- American Dietetic Association, American Diabetes Association. *Exchange Lists for Meal Planning*. 2nd ed. Alexandria, VA: American Diabetes Association; 2003.
- American Diabetes Association. *Standards of Medical Care in Diabetes*. Diabetes Care. 2007;30:S4-S41.
- Warshaw H, Kulkarni K. *American Diabetes Association Complete Guide to Carbohydrate Counting*. Alexandria, VA: American Diabetes Association; 2004.
- Warshaw H, Bolderman K. *Practical Carbohydrate Counting. A How to Teach Guide for Health Professionals*. Alexandria, VA: American Diabetes Association; 2001.