

# Diabetes and Nutrition

By

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Diabetes is in epidemic proportions worldwide. During the years 1980-1994 there was a 33% increase in diabetes in the United States. By the year 2050, it is predicted that black males and black females will have a 363% and 264% increase in diabetes prevalence respectively compared to 163% increase in Caucasians. One of the reasons for the dramatic increase in diabetes, especially in ethnic populations is lifestyle. Poor eating habits and lack of exercise has contributed to significant obesity in many ethnic populations. Presently, over 60% of Americans are classified as overweight. Only 5% of all Americans who go on a "diet" and achieve their ideal body weight are able to keep it off after one year. Research has shown that the best way to maintain weight loss is to include physical activity on a daily basis. The addition of exercise not only helps with controlling your blood sugar but also lowers your body fat. For those people with either Diabetes or "Pre-Diabetes", following a balanced, low-fat, high fiber diet is essential.

If you have diabetes it is important that you understand that you **DO NOT** need to eat special foods. You can eat basically the same foods as people without diabetes. You should eat small portions of a well balanced, low fat diet at about the same time each day. Try not to skip meals and incorporate small snacks into your meal plan. The goal is to keep your blood glucose as close to normal as possible. The number of calories you need depend on your age, size and how much daily exercise you get. The reason that we have so much obesity in the United States is due to the excess number of calories that we consume at each meal and the lack of physical activity. I suggest that you avoid "fad diets" since some of them may actually cause you to have problems with your kidneys or may adversely affect your blood sugar.

The control of blood glucose through diet is called Medical Nutrition Therapy (MNT). The goals of MNT include: maintaining near-normal blood glucose levels by balancing your food intake with medications (either insulin or oral hypoglycemia agents) and physical activity; achieving optimal serum cholesterol levels; maintaining adequate calorie intake to control weight gain and to achieve weight loss if necessary; preventing and treating acute and long term complications of diabetes; and improving

your overall health.

Currently there are two popular food management programs that are used as part of MNT for people with diabetes. *Carbohydrate Counting* or the *Exchange System*.

*Carbohydrate Counting* is an easy concept to understand. The main nutrient in food that affects blood glucose levels is carbohydrate. Carbohydrates are composed of starches and sugars. They account for most of the glucose in the

bloodstream. Only the amount of carbohydrate intake per meal is counted. Usually this is 45-60 grams per meal. Carbohydrates provide 4 calories of energy per gram. The down side to using this method is that is that the focus is on carbohydrates and fat and weight management is not initially addressed. In many ethnic populations, weight loss is essential to the prevention of future complications so carbohydrate counting **MAY NOT** be the best method for some ethnic populations.

Some foods that contain carbohydrates include:

Cereals, breads and grains

Pasta, rice and crackers

Vegetables

Fruit and Fruit Juices

Table Sugar, honey, syrup and candy

Yogurt and milk

With the Exchange System you must count Carbohydrates, Proteins and Fat. Proteins are found in meats, poultry, fish, milk and other dairy products. There are some vegetables that have small amounts of protein. Proteins are used by the body to promote growth and maintain energy. Proteins provide 4 calories of energy per gram.

Fats are found in margarine, butter, oils, salad dressing, nuts, milk, cheese, ice cream, snack foods, fast foods, etc. There are different types of fat: Monounsaturated, Polyunsaturated, and Saturated. Saturated fats have been linked to heart disease and have been found to increase your cholesterol levels. The "best" fats are monounsaturated and are found in olive oil, canola oil and peanut oil. Fats provide 9 calories of energy per gram.

The Exchange system lists food together because they are either have the same amount of carbohydrate, fat or protein calories. Foods that are listed together can be traded or "exchanged" for other foods on the list. Some of the common exchanges are shown in Table 1.

### What is the Glycemic Index?

This is a concept that is used by some nutritionists to control the blood sugar. Carbohydrates are absorbed into the blood stream at different rates. The faster a carbohydrate is digested and absorbed into the blood stream more rapid the blood sugar rises. Rapid rises in blood sugar levels have been found to be detrimental to the lining of the blood vessels (endothelium) and may be linked to cardiovascular disease. The Glycemic index is a measure or ranking of the effect of carbohydrate-containing foods on the postprandial (post meal) blood glucose.

### How do I Read a Nutrition Label?

In order to maintain your calorie intake and not overeat it is important to learn how to read the Nutrition labels ("Nutrition Facts") that is found on the back or side of most foods. The Nutrition label contains information on ingredients, serving size, servings per container, calories per serving, and detailed nutrient information. Total carbohydrate content is listed and broken down into sugars and dietary fiber. Total fat, saturated fat, and sodium content are also listed. You should avoid foods that have more than 30% fat. People with diabetes should get 50-55% of their calories from carbohydrates, 30% of their calories from fat and 20-25% of their calories from protein. If you are have wide swings in your blood sugar then you should consider decreasing your carbohydrate intake and adding more fiber to your diet. response compared to a reference or test food. Glycemic indices range from less than 20% to over 120%. There are many factors that can affect the glycemic index of a food; the carbohydrate structure, fiber content, how the food is cooked or processed, storage, ingestion of other nutrients simultaneously, etc. Foods that contain glucose or sucrose produce a large

## Nutrition Facts

Serving Size 2/3 cup (55g)  
 Servings Per Container 9

Amount Per Serving	Cereal with 1/2 cup Cereal Skim Milk	
	Cereal	Skim Milk
<b>Calories</b>	220	260
Calories from Fat	25	25
<b>% Daily Value**</b>		
<b>Total Fat</b> 2.5g*	<b>4%</b>	<b>4%</b>
Saturated Fat 1g	<b>5%</b>	<b>5%</b>
<b>Cholesterol</b> 0mg	<b>0%</b>	<b>0%</b>
<b>Sodium</b> 130mg	<b>5%</b>	<b>7%</b>
<b>Potassium</b> 40mg	<b>1%</b>	<b>7%</b>
<b>Total Carbohydrate</b> 46g	<b>15%</b>	<b>17%</b>
Dietary Fiber 4g	<b>12%</b>	<b>12%</b>
Sugars 16g		
<b>Protein</b> 4g		

increase in blood glucose levels whereas foods that contain high amounts of soluble fiber decrease glucose absorption. When you eat foods with a high glycemic index your hunger may return more rapidly. Table 1 provides a partial list of the glycemic index of some foods compared to one slice of White Bread (= 100).

### **How do I get started eating a healthy diet??**

I recommend that all people with diabetes should meet with a registered dietician in order to discuss their meal plan. As mentioned earlier the major reason for the obesity problem in the US stems from the fact that we eat TOO MANY CALORIES at each meal. Most women can achieve their ideal body weight by consuming 1200-1500 calories per day. Most men require 1800-2000 calories per day. You can eat more calories if you have a very active lifestyle and participate in moderate to vigorous exercise every day. Table 2 and 3 provide you with a calorie chart and sample menus. First you determine what calorie level you are at. Then you select which foods from Table 4. and plan your menu. Thinking ahead and planning your menus is very important. Preparation is the key to successfully achieving a lifestyle change. There are many books commercially available that provide a complete listing of foods and portion sizes for each food category. (ie. starch, fruit, milk, vegetable, meat / meat substitute and fat) In summary, the key to a healthy lifestyle begins with good nutrition. It is important for you and your family to begin eating a low calorie, low fat, balanced diet with an emphasis on increasing our fruits and vegetables. Here are some helpful hints that will help you begin to eat a more healthy diet and achieve your weight loss goals.

1. Set a weight loss goal. Focus on dietary and exercise goals that will give you long term, sustained weight loss.
2. Weight loss goal should be to reduce your body weight by 10 percent from where you started. A weight loss goal should be about 1 to 2 pounds per week for a period of 6 months. Try to decrease your current dietary intake by 500-1000 calories per day to lose 1-2 pounds per week.
3. Eat a well-balanced, low fat, high fiber diet with at least five servings of fruits and vegetables a day. Here are some suggest to help you eat more servings of fruits and vegetables.

- a. Buy frozen, dried, canned and fresh fruits and vegetables
  - b. Keep a fruit bowl or small packs or applesauce, carrots or raisins near you at all times
  - c. Add berries or sliced fresh fruit to you breakfast cereal
  - d. Enjoy ½-¾ cup of 100% fruit juice every morning
  - e. Add thinly grated carrots or succhini to soups, sauces and casseroles for a light, sweet taste and extra nutrient punch
  - f. Choose fruit for dessert. Top low-fat yogurt or sherbet with berries
4. Eat high-fiber foods, aiming for a total fiber intake of 25-30 grams per day.
  5. Use skim or 1 percent milk
  6. If you have high blood pressure you need to decrease your salt intake to 2000mg of sodium per day.
  7. Use low-fat cooking techniques like grilling, broiling, baking and steaming. Avoid fried foods.
  8. Have no more than one glass of alcohol per day (1 glass = 4 oz or wine, 12 oz. of beer, or 1 ½ oz or 80 proof spirits)
  9. When eating meat, poultry, or fish, limit you portion to 2 or 3 ounces ( the size of the palm of your hand)
  10. Choose lean cuts of meat and remove the skin from the poultry
  11. Replace whole-milk products with nonfat or 1% milk and nonfat or low-fat dairy items
  12. Use vegetable oil spray when cooking

### Table 1. Glycemic Index.

Cake	90	Waffles	109
Doughnut	108	All Bran Cereal	60
Oat Bran	50	Special K Cereal	77
Cocoa Puffs	110	Brown Rice	79
Oatmeal Cookies	79	White Rice	126
Apple	52	Banana	78
Orange Juice	74	Macaroni & Cheese	92
Orange	62	Carrots	101
French Fries	107	Sweet Potato	77

### Table 2.

Calorie Meal Plans (Daily)	1,200	1,500	1,800	2,000
Starch 5 7 8 9	5	7	8	9
Fruit 3 3 4 4	3	3	4	4
Milk 2 2 3 3	2	2	3	3
Vegetables	2	2	3	4
Meat / Meat Substitutes	4	4	6	6
Fat	3	4	4	5

### Table 3. Sample Menus for each calorie level

<i>1,200 Calories</i>	<i>1,200 Sample Calories</i>	<i>Menu 1,500</i>	<i>Calories 1,800</i>	<i>2,000 Calories</i>
<b>Breakfast</b> 1 Starch 1 Fruit 1 Milk	English muffin ½ Banana (medium) ½ Hot Cocoa Mix (artificially sweetened) 1 envelope	Add 1 starch	Add 1 Starch	Add 1 Starch 1 Fat

<p><b>Lunch</b> 1 Starch 2 Meat 1 Vegetable 1 Fruit 1 Fat</p>	<p>1 wheat roll 1 oz. Chicken 1 oz Cheese 1oz Beans Apple (raw - 2" across) Salad dressing (reduced calorie) 2 Tbsp</p>	<p>1 Starch</p>	<p>1 Starch 1 Meat 1 Milk</p>	<p>1 Starch 1 Milk 1 Fat 1 Vegetable</p>
<p><b>Afternoon Snack</b> Nothing</p>				<p>1 Starch</p>
<p><b>Dinner</b> 2 Starch 2 Meat 1 Vegetable 1 Fruit 2 Fat</p>	<p>Rice 1/3 cup Peas (cooked) 1/2 cup Turkey 2 oz. Onions Butter 1 tsp Oil 1 tsp Canned fruit in juice 1/2 cup</p>			
<p><b>Evening Snack</b> 1 Starch 1 Milk</p>	<p>Low-fat or nonfat milk 8 oz. Popcorn 3 cups</p>			

**Table 4 \_ Exchange list. Each item listed is one serving**

<p>Starch -1 serving - 80 calories Cereal / Beans / Grains / Pasta Cereal (cooked) 1/2 cup Beans (cooked or canned) 1/3 cup Rice (cooked) 1/3 cup Pasta (cooked) 1/2 cup</p>	<p>Milk - 1 serving = 90-100 calories Low-fat or non fat milk 8 oz. Low-fat or nonfat buttermilk 8 oz. Yogurt (nonfat plain or artificially sweetened) 8 oz Hot cocoa mix (artificially sweetened) 1 envelope</p>
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<p>Breads - 1 serving - 80 calories                  Bagel or English Muffin ½ or 1oz.                  Bread (slice or roll) 1oz.                  Crackers, snack 4-5                  Graham crackers 3 squares                  Hamburger or hot dog bun ½ or 1oz.                  Popcorn (plain, unbuttered) 3 cups</p>	<p>Lean Meats/ Meat Substitutes - 1 serv - 35-55 calories                  Cheese (1-3 grams of fat) 1 oz.                  Chicken (white, no skin) 1 oz.                  Cottage Cheese ¼ cup                  Fish (tuna, cod, flounder) 1 oz                  Lean beef (flank, round, sirloin) 1 oz.                  Turkey (white, no skin) 1 oz</p>
<p>Fruit - 1 serving 60 calories                  Apple (raw - 2" across).                  Banana (medium) ½                  Cherries 12                  Dried Fruit ¼ cup                  Canned fruit in juice or water ½ cup                  Grapes 12-15.                  Apple, orange or grapefruit juice ½ cup.                  Cranberry, grape or prune juice 1/3 cup</p>	<p>Medium/High-fat Meats - 1 serving 75-100 calories                  Beef 1 oz.                  Chitterlings 1 oz.                  Chicken (dark meat, no skin) 1 oz                  Eggs 1                  Pork (spareribs, barbecue, chops, cutletsw) 1 oz                  Sausage 1 oz.                  Weiners 1 oz.</p>
<p>Free Foods have less than 20 calories and have very little affect on your blood sugar</p> <p>Club soda - (Note: avoid if you have high blood pressure)                  Drink Mixes Herbs                  Mineral water Mustard                  Tea Vinegar                  Gelatin desserts Salsa                  Sugar substitutes                  Garlic or garlic powder Fats - 1 serving - 5 grams fat, 45 calories</p>	<p>Avocado (4" across) 1/8 Nondairy creamer (dry) 4 tsp                  Bacon 1 slice Nondairy creamer (liquid) 2 Tbsp                  Oil 1 tsp Cream (light, table coffee, sour) 2 Tbsp                  Butter 1 tsp Nuts or seeds 1 Tbsp                  Pesto Sauce 2 tsp Cream Cheese 1 Tbsp                  Salad Dressing (reduced calorie) 2 Tbsp                  Margarine 1 tsp                  Mayonnaise 1 tsp                  Cream (light, table coffee, sour) 2 Tbsp</p>