

# BE CARB SMART!

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## WHAT IS A CARBOHYDRATE?

- Carbohydrates are one of **three macronutrients**: carbohydrate, protein and fat.
- Chains of sugar molecules – carbon, hydrogen and oxygen
- A major source of **energy** in the diet
- Body uses carbohydrates to make **glucose** – fuel that gets into cells and keeps your body functioning
- Body can use glucose immediately or store for future use – **glycogen** in muscle or liver
- Any glucose remaining gets **stored as fat**

## CARBOHYDRATES

- The body's preferred source of ENERGY – before protein and fat
- Carbs provide most of the **energy** needed in our daily lives, both for normal **body functions** such as heartbeat, breathing, pumping blood and digestion as well as the physical work we perform each day – the activities of daily living and exercise



## WHICH FOODS CONTAIN CARBOHYDRATES?

- **Grains:** Oats, Barley, Corn, Rice, Quinoa, etc.
- **Grain products:** Breads, crackers, cookies, pasta, cereal
- **Fruits**
- **Vegetables:** especially starchy ones
- **Beans and legumes** (also contain protein)
- **Dairy products:** Milk, yogurt, ice cream
- **Sugars:** honey, syrup, corn syrup, sugar, etc



## ARE CARBS GOOD OR BAD?

- The short answer is YES!
- **Higher-fiber carbs**, such as whole grains, beans, fruits, and vegetables are *loaded with nutrients*
- But *refined carbs* and foods, like cookies, most crackers, cake, sugary foods, donuts, coffee cakes, packaged sweet cereals, packaged snack treats and chips are just empty calories that wreck havoc with your blood sugar and your health

## REFINED CARBOHYDRATES

- **Refined carbohydrate foods:** Foods that have been **processed** from whole ingredients.
- Examples include sugar and white flour and foods made with these ingredients.
- Refined foods **lose fiber and important nutrients**.
- For example, white flour is a refined food made from whole wheat kernels. Sugar is a refined food made from sugar cane
- Refining foods **increases palatability and calorie density**.
- Palatability and calorie density make it much **easier to eat too many calories**.

## SUGAR

- It takes **2,000 pounds of sugar cane** to make about **192 pounds of raw sugar**.
- It is very easy to eat 100 calories of sugar. But very difficult to eat that amount from the sugar cane itself: very "woody"



## SUGAR

- There's no way to sugarcoat the truth: Americans are eating **more sugar than ever before**.
- In fact, the average adult takes in about **20 teaspoons of added sugar every day**, according to the USDA's recent nationwide food consumption survey
- That's about 320 calories, which can quickly up to extra pounds.
- Many adults simply don't realize how much added sugar is in their diets.



## AVOID “ADDED SUGARS”

- **Added sugars** are sugars and syrups that are added to foods at the table or during processing or preparation (such as high fructose corn syrup in sweetened beverages and baked products)
- Added sugars supply **calories but few or no nutrients**
- Americans are very aware of low-fat diets and because of that we've been **eating more fat-free and low-fat products**
- But what many people don't know is that in many of these products, **sugar is being substituted for fat, so we've really been trading fat for sugar**
- The USDA recommends that we get no more than 6% to 10% of our total calories from **added sugar** -- that's about nine teaspoons a day for most of us (4 grams of sugar in a teaspoon so about 36 grams) – less is best

## AHA AND SUGAR

- The American Heart Association has even more-specific guidelines for added sugar — no more than 100 calories a day from added sugar for most women and no more than 150 calories a day for most men.
- That's about 6 teaspoons of added sugar for women (24 grams) and 9 for men (36 grams).



## ADDED SUGARS IN FOODS

- Krispy Kreme original glazed doughnut -- **10 grams**
- Ben & Jerry's vanilla ice cream -- **16 grams**
- Starbucks caffè latte grande (16 oz) -- **17 grams**
- Subway 6" sweet onion teriyaki chicken sandwich -- **17 grams**
- Yoplait original yogurt -- **27 grams**
- Vitamin Water (20 oz bottle) -- **33 g**
- Oscar Mayer Lunchables crackers, turkey & American cheese -- **36 grams**
- Coca-Cola Classic 12 oz can -- **39 grams**
- California Pizza Kitchen Thai chicken salad -- **45 g**
- Jamba Juice blackberry bliss 16 oz -- **49 g**
- Odwalla SuperFood 450 ml bottle -- **50 g**
- Starbucks caffè vanilla frappuccino grande (16 oz) -- **58 g**

### Nutrition Facts

Serving Size 1/5 of recipe 120g (120 g)  
Servings per container 5

#### Amount Per Serving

**Calories 217**      Calories from Fat 104

#### % Daily Value\*

<b>Total Fat</b> 12g	19%
Saturated Fat 4g	20%
Trans Fat	
<b>Cholesterol</b> 10mg	3%
<b>Sodium</b> 137mg	6%
<b>Total Carbohydrate</b> 21g	7%
Dietary Fiber 3g	13%
Sugars 4g	

#### Protein 8g

Vitamin A 155% • Vitamin C 20%  
Calcium 10% • Iron 13%

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

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### Nutrition Facts

**8 servings per container**

Serving size 2/3 cup (55g)

Amount per 2/3 cup

**Calories 230**

#### % DV\*

<b>12%</b>	<b>Total Fat</b> 8g
<b>5%</b>	<b>Saturated Fat</b> 1g
	<b>Trans Fat</b> 0g
<b>0%</b>	<b>Cholesterol</b> 0mg
<b>7%</b>	<b>Sodium</b> 160mg
<b>12%</b>	<b>Total Carbs</b> 37g
<b>14%</b>	<b>Dietary Fiber</b> 4g
	<b>Sugars</b> 1g
	<b>Added Sugars</b> 0g
	<b>Protein</b> 3g

10% **Vitamin D** 2mcg  
20% **Calcium** 260mg  
45% **Iron** 8mg  
5% **Potassium** 235mg

\* Footnote on Daily Values (DV) and calories reference to be inserted here.

## FOOD LABEL

- The Nutrition Facts section on food labels can help you sort the good carbs from the bad carbs. Here's what to look for on the Nutrition Facts label.
- **Total Carbohydrate.** For tracking the total amount of carbohydrate in the food, per serving, look for the line that says "Total Carbohydrate."
- You'll find that often the grams of "fiber," grams of "sugars" and grams of "other carbohydrate" will add up to the grams of "total carbohydrate" on the label.
- **Dietary Fiber.** The line that says Dietary Fiber tells you the total amount of fiber in the food, per serving. Dietary fiber is the amount of carbohydrate that is **indigestible and will likely pass through the intestinal tract without being absorbed.**

## FOOD LABEL

- **Sugars.** "Sugars" tells you the **total amount of carbohydrate from sugar** in the food, from all sources -- **natural sources** like lactose and fructose as well as **added sugars** like high-fructose corn syrup.
- It's important to distinguish between natural sugars and added sugars. For example, the average 1% low-fat milk label will list 15 grams of "sugar" per cup. Those grams come from the lactose (milk sugars) not from added sweeteners.
- To get an idea of how many grams of sugar on the label come from added sugars -- such as high fructose corn syrup or white or brown sugar -- check the **list of ingredients on the label.**
- See if any of those sweeteners are in the top three or four ingredients. Ingredients are listed in order of quantity, so the bulk of most food is made up of the first few ingredients

## FOOD LABEL

- **Other Carbohydrate.** The category "other carbohydrate" represents the digestible carbohydrate that is not considered a sugar (natural or otherwise).
- **Sugar Alcohols.** Some product labels also break out "sugar alcohols" under "Total Carbohydrate." In some people, sugar alcohol carbohydrates can cause intestinal problems such as gas, cramping, or diarrhea. If you look on the ingredient label, the sugar alcohols are listed as lactitol, mannitol, maltitol, sorbitol, xylitol, and others.
- Many "sugar free" or "reduced calorie" foods contain some sugar alcohols even when another alternative sweetener like Splenda is in the product.

## COMPARE GRAIN PRODUCTS

- Compare grain products:
- - 8 ounces (1 cup) cooked whole wheat cereal = 149 calories
- - 8 ounces French bread: 403 calories
- - 8 ounces cookies: **1,020 calories!**
- The more you refine foods and **add sugars** and fats to them, the more palatable and high in calories they become.
- Unfortunately for so many, the **more irresistible** they also become!



## WHOLE PLANT FOODS

- **Whole plant foods:** Minimally processed foods from plants that are in their whole, near natural state.
- These are generally lower in calories, higher in fiber, and higher in nutrients than their refined counterparts.
- Examples of whole foods are fruits, vegetables, beans or legumes, and whole grains.
- They are generally less palatable so you **won't tend to overeat them**.
- Whole foods are also **more satiating**; that is, you feel more full on fewer calories



## COMPARE POTATOES



- Compare potato foods:
  - - 4 ounces baked potato = 82 calories
  - - 4 ounces French fries = 348 calories
  - - 4 ounces potato chips = 608 calories
- A 5-ounce apple contains 73 calories.
- A 5-ounce slice of apple pie contains 389 calories



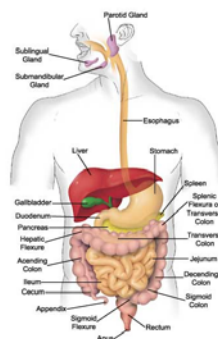
## CARBOYDRATES

- Good carbs **promote health**
- **Bad carbs** – when eaten too often and in large quantities – increase risk/progression of:
  - Diabetes
  - High triglycerides
  - Coronary heart disease
  - High blood pressure
  - **Inflammation** and many other chronic diseases



## CARBOHYDRATES

- Good carbs provide a role in **weight loss and weight control**
- **Normal GI functioning**
- **Prevention** of CV disease, high blood pressure, certain cancers and diabetes:



## CARBOHYDRATES

- Should comprise approximately **40-50% of daily calories**
- **40% for those not as active**
- 1200 calories – 120 grams of carbs per day
- 1500 calories – 150 grams of carbs per day
- 2000 calories – 200 grams of carbs per day

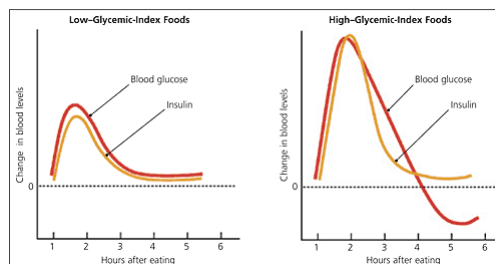
## HEALTHY CARBS

- Most common carbs are sugar, starches, fiber
- **Healthy carbs:**
- **Sugars:** In fruit (fructose), dairy (lactose) foods
- **Starch:**– plant foods such as grains ( whole wheat, corn, barley, rye, oats, millet), beans (kidney, pinto, black, soybeans), rice, peas, beets, yams, potato
- **Fiber:** Found in whole grains, fruits and vegetables



## HOW CARBOHYDRATES ARE ASSIMILATED

- Eat a carbohydrate-containing food – an orange, slice of bread, popcorn
- Digestive system breaks down digestible carbs into sugar/glucose
- Sugar enters bloodstream
- **Blood sugar levels rise**
- Pancreas churns out **insulin** – hormone signals cells to absorb blood sugar for energy or storage

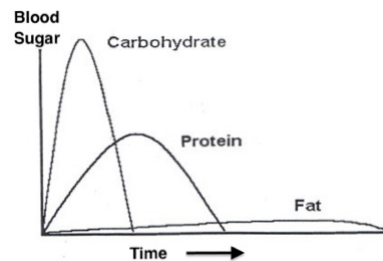


## CARBOHYDRATES

- Cells, including muscle cells, sponge up blood sugar
- Blood sugar levels in bloodstream begin to fall (sugar now inside cells)
- Over time the cells in pancreas start making **glucagon** – hormone that tells liver to start releasing stored sugar - hunger
- Interplay of insulin/glucagon ensure cells throughout body (esp brain) have steady supply of blood sugar

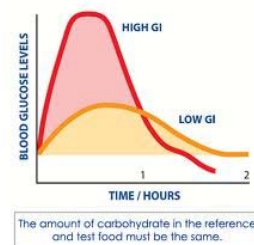
## CARBOHYDRATES

- **Carbohydrate**-containing foods alter your blood sugar levels **more** than any other type of food.
- **Protein and fat** also turn into glucose (blood sugar) in the body, but raise blood sugar **much less dramatically**



## REFINED GRAINS

- The type of carb you eat makes a BIG difference in the way you metabolize food and in the amount of energy you have
- Refined grains are *quickly digested* into simple sugars and absorbed into your bloodstream
- Blood-sugar levels ***spike and then quickly crash***
- Rapid swings drain your energy and leave you feeling moody and tired



## HIGH GLYCEMIC/REFINED CARBS

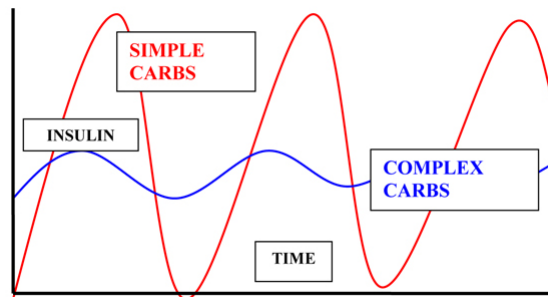
- **Glycemic index** – *GI Index*: classifies carbohydrates based on how quickly and how high they boost blood sugar compared to pure glucose
- **Foods with high GI**: “white carbs”, cause rapid spikes in blood sugar
- **Foods with low GI**: whole grains, fruit are digested slowly, causing lower/gentler change in blood sugar

## GLYCEMIC INDEX

- Using the glycemic index is easy: choose foods in the low GI category instead of those in the high GI category (see below), and go easy on those in between. The glycemic index uses a scale from 0 to 100. The reference standard is generally pure glucose (sugar), set at 100. The amount of food measured is 50 grams of carbohydrate so 50 grams of carbohydrates of carrots is compared to 50 grams of carbohydrates of glucose.
- **Low glycemic index** (GI of 55 or less): Most fruits and vegetables, beans, minimally processed grains, pasta, low-fat dairy foods, and nuts.
- **Moderate glycemic index** (GI 56 to 69): White and sweet potatoes, corn, white rice, couscous, breakfast cereals such as Cream of Wheat and Mini Wheats.
- **High glycemic index** (GI of 70 or higher): White bread, rice cakes, most crackers, bagels, cakes, doughnuts, croissants, most packaged breakfast cereals.

## FIBER

- Rich in fiber
- Fiber **helps temper blood sugars by SLOWING** the absorption of sugar into your bloodstream after meals
- Provide long-lasting energy that will keep you fueled for hours



## GLYCEMIC INDEX

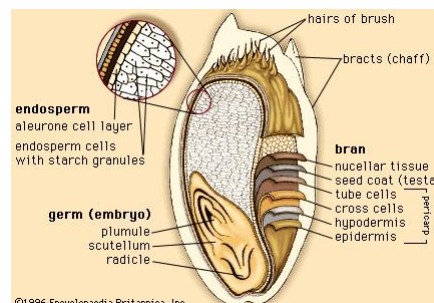
- Grains in their natural form have a low glycemic index, while processed carbohydrates, especially those made with flour or puffed grains, have a high GI.
- The reason is that it **takes longer for digestive enzymes to reach the starch** inside whole grains or grains cracked into large pieces, slowing down the conversion of starch to sugar.
- Pulverized grains (in breads) have a tremendous surface area for enzymes to work on.
- This leads to quick starch-sugar conversions that spike blood sugar levels, creating dips later on that can prompt more consumption of pulverized grains, and the cycle continues.

## GLYCEMIC LOAD

- When using the glycemic index, be sure to consider "glycemic load," which takes account of how **many grams of carbohydrate** a normal serving contains.
- For example, carrots rank high on the glycemic index, but the amount of carbohydrates you would actually consume in a normal serving is pretty low, only 6.2 grams of carbohydrates. A 50-gram-carbohydrate portion (used to measure the glycemic index) of carrots is over 4 cups!
- Don't avoid carrots (or beets) based on their GI rankings. Unless you eat huge portions, these vegetables will not disturb your blood sugar very much, and they provide important phytonutrients.

## STUDIES

- Review study of 17 studies published in PubMed consistently found a 20% to 40% reduction in long-term risk of cardiovascular disease and type 2 diabetes in people who ate at least 3 servings of whole grains per day
- Recent studies show a diet rich in whole grains may reduce the risk of obesity and cancer as well
- Whole grains have all 3 parts: bran, germ and endosperm



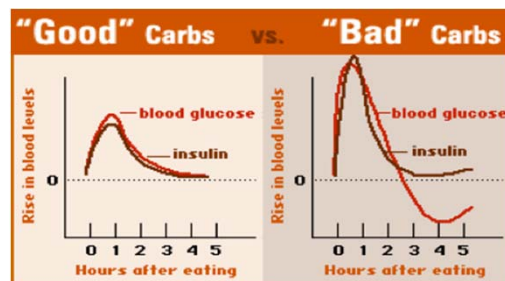
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## WHAT IS A SERVING?

- One oz equivalent: **15 grams of carbs**
- 1 slice of bread
- ½ cup breakfast cereal
- ½ cup cooked pasta, rice, oatmeal
- **Note:**
- 1 Einstein Bagel: 75 grams carbs (5 servings)
- Olive Garden Shrimp Primavera dinner: 110 grams carbs (7 servings)
- Subway 6" sub: 45-75 grams carbs (3 to 5 servings)

## INSULIN RESISTANCE/DIET

- Constantly eating refined/ high glycemic carbs: (break down/digest quickly)
- White bread
- White rice
- White pasta
- Pastries, chips, soda, cookies, cake, etc.
- Promotes insulin resistance



## INSULIN RESISTANCE/DIABETES II

- Body cells **don't respond** well to insulin's "open up for sugar" signal
- Causes blood sugar and insulin levels to stay high long after eating
- Constantly high blood sugars **damage body cells** – neuropathy, blindness, amputation
- Over time, the heavy demands made on insulin-making cells wears them out – insulin production slows then stops - diabetes

## INSULIN RESISTANCE

- Linked to high blood pressure
- High levels of triglycerides
- Low HDL (good) cholesterol
- Excess weight
- Insulin Resistance can lead to type 2 diabetes, heart disease and possibly some cancers
- Researchers estimate **90% type 2 diabetes could be prevented through healthy diet and active lifestyle**

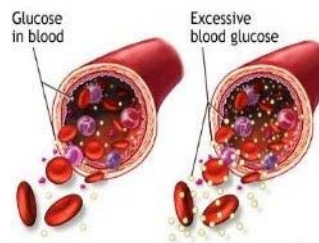
## METABOLIC SYNDROME – 3 OR MORE

- Abdominal obesity:
- Men >40" waist circumference
- Women > 35" waist circumference
- High triglycerides: > 150 mg/dL
- Low HDL: Men: < 40 mg/dL, Women: < 50 mg/dL
- **Insulin Resistance**
- High blood pressure



## DIETS RICH IN HIGH GLYCEMIC FOODS

- Linked to increased risk for **diabetes, heart disease, insulin resistance, overweight (increases belly fat)**
- Preliminary research links to age-related macular degeneration, ovulatory infertility, and colorectal cancer as well



## LOW GLYCEMIC – MAY REDUCE RISK OF CHRONIC DISEASES

- Study done in American Journal of Clinical Nutrition 2008
- 40,129 cases of chronic diseases
- 4-20 year follow up
- Low glycemic diets found to be **independently associated with: reduced risk of type 2 diabetes, Coronary heart disease, gall bladder disease, breast cancer**

## DIETS RICH IN LOW GLYCEMIC FOODS

- Most research shows low GI foods help **control type 2 diabetes**, and help with weight loss
- Low GI foods more nutritious/less processed: whole grains, beans, fruits and vegetables
- The more a food is processed: *milling, grinding, removing fiber* – the higher the GI will be
- Whole wheat bread and products labeled "whole grain" are often not good choices because they usually are made with pulverized grains (flour) rather than whole or cracked grains. For that reason, most whole wheat bread has the same high GI ranking as white bread - about 70.

## WHAT TO USE IN BAKING

- Substitute whole-grain flour in recipes:
- Whole wheat
- Whole cornmeal
- Whole oat flour
- Or nut flours like almond meal
- Or bean flours like garbanzo bean flour



## WHOLE GRAINS

- Pasta: Regular pasta made from refined white durum wheat flour
- Choose whole grain pasta: wheat, rice, quinoa, corn or use spaghetti squash and vegetables instead
- Rice: white rice very low in fiber
- Raises triglycerides much like sugar does
- Opt for brown rice whenever possible or barley is even better



## FIBER

- Body cannot digest fiber
- Essentially non-caloric
- Helps fill you up on fewer calories
- Helps **stabilize blood sugar** by slowing down gastric emptying
- Lower GI in foods high in fiber
- Helps keep appetites satisfied longer

## HEALTH BENEFITS OF FIBER

- Promotes proper waste removal
- Maintains gut and immune system health by promoting growth of healthy bacteria in the gut
- 70% of immune system is in gut
- **Lowers cholesterol**
- **Helps control blood sugar**
- **One of best tools for weight loss**

## HEALTH BENEFITS OF FIBER

### Disease Prevention

- Cardiovascular disease
- Reduces CRP - inflammation
- Type 2 diabetes
- Cancer
  - breast, rectal, prostate, laryngeal and ovarian

## LARGEST GOVERNMENT STUDY ON FIBER

- Archives of Internal Medicine Feb 2011
- 219,123 men and 168,999 women
- Fiber intake associated with **significant decrease risk of total death in both men and women**
- Lower death from CV disease, cancer and respiratory disease as well as reduced risk of death from ANY disease over 9 year period

## FIBER STUDY

- Participants fiber intake ranged from 13 to 29 grams per day in men and 11 to 26 grams per day in women
- 20% of men and women consuming the highest amount of fiber (29 grams per day for men and 25 grams for women) were **22% less likely to die than those consuming the least** (12 grams men and 10 grams women)
- CV disease, infectious and respiratory diseases was reduced by 56% in men and 59% women

## HOW MUCH FIBER DO I NEED?

- 25 – 40 TOTAL grams/day
  - Or 15 – 20 grams per 1,000 calories consumed
  - Average American gets 11-13 grams
- From a combination of soluble and insoluble fiber sources
- Can use fiber supplements



## FIBER SUPPLEMENTS

- Organic Clear Fiber
- Benefiber
- Metamucil or psyllium
- Konsyl
- Glucomannan
- Flaxseed
- IMPORTANT!
- Increase water when you increase fiber!!!!!!

**1** Take psyllium fiber, like Metamucil. It's a great cholesterol-lowering fiber

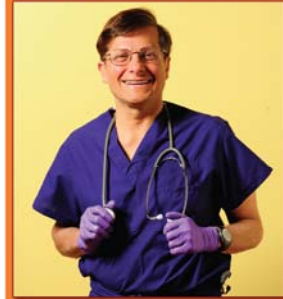
**2** Wear a pedometer. See how much daily exercise you're *really* getting

**3** Get an exercise buddy. Two makes it more fun – and motivating

**5** Beware of hidden fat and sugar. Avoid trans-fats, high fructose corn syrup

**4** Add DHA. A simple add to lower cholesterol and help your heart

**5** Things Every American Should Do to Lower Cholesterol  
by Dr. Michael Roizen



[www.WinaHearttoHeart.com](http://www.WinaHearttoHeart.com)

"Every time you add 10 grams of fiber, there is a 14% reduction for all risks of coronary heart disease and a 27% reduction in risks for coronary heart disease mortality."

Mark Pereira, Epidemiologist  
University of Minnesota



## FIBER

- Soluble and Insoluble

- Soluble – Dissolves in water (lowers cholesterol, blood sugar)
- Insoluble – Doesn't
- BOTH are important

## SOLUBLE

- Binds to fatty substances
  - Helps excrete cholesterol and fat
- Try for 10-12 grams per day to reduce cholesterol
- Found in:
  - Oats, Legumes, Barley, Apples, Citrus fruits, Strawberries, Carrots



## HEALTH CLAIMS

- On food labels:  
*"Soluble fiber as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease."*
- Reduces LDL cholesterol



## CHOLESTEROL LOWERING

- Intake of 3 grams of soluble fiber is recommended to reduce blood cholesterol by up to 5%.
  - I recommend 10-12 grams per day.
- 1 ½ cup of cooked oatmeal or 1 cup cooked oat bran provide 3 grams



## LEGUMES

- Soluble fiber in legumes (lentils, pinto, kidney, garbanzo, navy, soy and black beans) can lower total and LDL cholesterol
- 1 cup per day can lower cholesterol by 10-20 %
- ½ cup per day can lower cholesterol by 12%
- Resistant starch – weight loss



## FIBER AND WEIGHT

- Stabilizes blood sugar – keeps hunger in check
- Fiber in starch draws water to intestines
- Slows down digestion
- Studies show that weight loss with whole grains *reduces belly fat more than refined grains*
- *Helps keep you satisfied longer so you don't get "hangry"*



## WHAT ABOUT GAS?

- Eating more whole grains/fiber can increase gas
- Increase fiber SLOWLY!
- Increase water
- Add Beano and/or digestive enzymes
- Enzymedica – Digest Gold at health food store



## AT THE GROCERY STORE

- When buying bread, cereal, pasta, rice, pancake mix, crackers, etc. look for "100% WHOLE" listed first on the ingredient list:
- Whole wheat
- Whole oat
- Whole grain
- Whole brown rice



## WATCH OUT FOR:

- “Made with whole grains” – may have a tiny bit of whole grain
- “100% wheat” – doesn’t mean 100% WHOLE wheat
- “Multigrain” – means made with multiple grains , but nothing about whether grains are WHOLE
- “Whole grain” – if label doesn’t say 100% WHOLE grains it may a small part of whole grain

## WATCH OUT FOR:

- Enriched
- Bleached
- Unbleached
- Semolina
- Durum
- Rice flour



## WHOLE GRAINS

- "Good source" means it has 8 grams of whole grains per serving or as little as 13.5%
- Don't confuse whole grain with fiber – 8 grams of whole grain may have less than 1 gram of fiber
- "Excellent source" – 16 grams of whole grain or as little as 27%

## TRY DIFFERENT WHOLE GRAINS

- Barley
- Bulgur
- Millet
- Quinoa
- Wild/brown rice
- Popcorn
- Oats
- Rye



## TIPS FOR EATING HEALTHIER CARBS

- Whole fruit vs juice
- Two vegetables with evening meal
- Keep bowl of washed veggies in fridge – carrots, cucumber, cherry tomatoes, pea pods, etc
- Use dried beans for protein
- Add vegetables to stir fry, sandwiches, omelets
- [www.fruitsandveggiesmatter.gov](http://www.fruitsandveggiesmatter.gov) for ideas

## TIPS FOR EATING HEALTHIER CARBS

- Try a whole grain in salad form such as brown rice or quinoa, add beans and vegetables with a low-fat balsamic dressing
- Pass on potatoes, and instead bring on the beans
- Try High Fiber Tortillas – La Tortilla Factory Tortillas
- Have 3 cups of popped corn instead of chips for a snack
- Fill ½ your lunch and dinner plate with non-starchy vegetables
- Have berries drizzled with dark chocolate for dessert



## THE HEALTHIEST CARBOHYDRATE CHOICES

Vegetables

Fruit

Whole grains

Whole grain products

Beans, Legumes, Peas, Beets, Corn

Sweet potato

High fiber cereal



- “To eat is a necessity, but to eat intelligently is an art.” - La Rochefoucauld



# Let's Get Cooking!

