

Metabolism 101

The human body is remarkably adept at making do with whatever type of food is available. Our ability to survive on a variety of diets has been a vital adaptation for survival as our species originally evolved under conditions where food sources were scarce and unpredictable. Understanding the three types of basic macronutrients and their effects in the body can help us make better choices when it comes to our own diets.

From the moment we take a bite of food, each nutrient contained within the food being eaten starts to be broken down for use by the body by a process known as metabolism. This series of chemical reactions transforms food into components that can be used for the body's basic processes. The three main macronutrients (proteins, carbohydrates, and fats) move along intersecting sets of metabolic pathways that are unique to each major nutrient. Fundamentally—if all three nutrients are abundant in the diet—carbohydrates and fats will be used primarily for energy while proteins provide the raw materials for making hormones, muscle, and other essential biological equipment.

Proteins in food are broken down into pieces (called amino acids) that are then used to build new proteins with specific functions, such as catalyzing chemical reactions, facilitating communication between different cells, or transporting biological molecules from here to there. When there is a shortage of fats or carbohydrates, proteins can also yield energy.

Fats typically provide more than half of the body's energy needs. Fat from food is broken down into fatty acids, which can travel in the blood and be captured by hungry cells. Fatty acids that aren't needed right away are packaged in bundles called triglycerides and stored in fat cells, which have unlimited capacity. Our bodies are exceptionally good at storing fat!

Carbohydrates on the other hand, can only be stored in limited quantities, so the body is eager to use them for energy. In fact, they are the body's preferred source of fuel when all three macronutrients are present and are used more readily than fat. Because we can only store approximately one to two days of carbohydrates, when they are consumed carbs are quickly digested into small pieces and absorbed through the walls of the small intestine. After a quick stop in the liver, glucose enters the circulatory system, causing blood glucose levels to rise.

Once the cells have had their fill of glucose, the liver stores some of the excess for distribution between meals should blood glucose levels fall below a certain level. If there is leftover glucose beyond what the liver can hold, it is turned into fat for long-term storage so none is wasted. When carbohydrates are scarce, the body runs mainly on fats. If energy needs exceed those provided by fats in the diet, the body will use some of its fat tissue for energy.

The Great Carbohydrate Debate

When it comes to eating healthfully, there may be no topic more controversial than carbohydrates. Sure, everyone agrees that the body uses carbs for energy in the form of glucose. But how much carbohydrate should people really eat? This exact question continues to perplex and divide researchers, doctors, dietitians and other healthcare providers alike.

Most healthcare providers encourage people to eat a balanced diet of lean meats and dairy, whole grains, healthy fats, and fruits and vegetables. This concept is backed by the American Diabetes Association, the American Heart Association and the American Dietetic Association, and incorporates recommendations from agencies like the Department of Agriculture and the Department of Health and Human Services.

Moderate Carbohydrate diet:

- This approach stresses moderate portions of carbohydrates (generally about 40 to 45 percent of total calories) from carbohydrates and recommends that grains should come in the form of whole grains instead of refined grains (like white flour), which have been stripped of important vitamins and minerals.
- The “types” of carbohydrates that are consumed in this approach are VERY important because the foods that contain complex carbohydrate also tend to contain a lot of other healthy things. Consider the four major categories of foods that have carbs: fruits, vegetables, grains, and dairy. Many of the individual foods in those categories are nutrition powerhouses. Legumes like lentils and black beans are chock-full of soluble fiber, which helps lower cholesterol levels. Veggies and fruits are a great low-calorie source of vitamins and minerals. Low-fat dairy products provide calcium and, in many cases, vitamin D.
- Not only that, but these types of carbohydrates are an efficient source of energy for your body, but they are a far cry from the refined processed carbohydrates that spike blood glucose levels and offer very little to any nutrients.
- Research has shown that eating a moderate-carb, high-fiber diet (like one that includes whole grains) may improve post-meal glucose levels and lower the risk for cardiovascular disease.
- Offers flexibility

The Low-Carb Approach

- Proponents of the low-carb diet say the best way to keep blood glucose levels low is to avoid raising them in the first place. As the body’s fastest, easiest source of glucose, carbohydrates are the obvious target.
- Advocates a higher-protein, higher-fat diet, and keeps daily carbohydrate consumption to approximately 20 to 30 grams of carbohydrate which is about 1 to 2 servings of carbohydrates/day which is typically less than 10 percent of total calories.

- Some people who follow a lower-carb diet are less stringent, allowing 20 to 40 percent of their calories to come from carbs.
- Forces the body to burn other types of fuel in the form of protein and fat.
- Some types of cells, such as brain cells, have special needs and can not run on these fatty acids directly. So under low carb conditions, these cells require the body to make fat-like molecules called ketone bodies.
- Some tissues still require at least some glucose, which isn't normally made from fat. Instead, glucose can be made in the liver and kidneys using protein from elsewhere in the body.
- Of note: If not enough protein is provided by the diet, the body starts breaking down muscle cells.
- Restrictive and may be hard to stick to over time.

High Carbohydrate Approach:

- Primarily based on a vegan diet.
- Contains no animal food or products, including dairy.
- All proteins come from plant based sources.
- Roughly 75 percent of calories come from carbohydrates.
- Studies have linked this diet to improved heart health and glycemic control.
- Restrictive and may be hard to stick to over time.

So why the controversy?

- Part of the reason for the great carb divide is that science hasn't settled the debate.
- Some research demonstrates the benefits of a low-carb diet, while others show benefits of both moderate and high-carb diets.
- There is little long-term research on the subject and researchers differ on how to quantify long term study results. Part of the problem is cost: Long-term studies are expensive to conduct. And it's difficult to consistently measure a large group of people's food intake over years or decades.
- There is likely no "one-size-fits-all " approach that works for everyone.
- Some people do better on a low carb diet while others benefit from eating a higher-carb diet.

So what's the right approach?

- Keep in mind that what works for someone else may not necessarily work for you—and vice versa.
- You may need to experiment a bit to see how different methods affect your blood glucose levels.
- Consider making an appointment with a Registered Dietitian, who can review your individual needs and circumstances and help you tailor a nutrition plan that's right for you.
- In the end, the best diet is the healthy one you're able to follow.

Carbohydrates 101

While a diet rich in complex carbohydrates and fiber can be an important component in a health promoting diet, simple carbohydrates (processed foods) should be avoided as these provide empty calories and negatively influence insulin levels.

Research has shown that simple sugars and sweets can raise insulin in the body to unhealthy levels and may increase the risk of several different types of disease, including cancer. For this reason, you should be sure to focus on eating *complex* carbohydrates!

Use the following tips to get started:

- When you do eat carbohydrates, don't waste your time on sugary desserts, refined (white) breads, bagels and muffins, pastas or snack foods. Instead, start basing your diet around **UNPROCESSED** whole plant foods such as vegetables, fruit, whole grains, legumes, nuts and seeds.
- Always use **WHOLE GRAIN** breads, bagels, baked goods and pastas. Here's a tip: If you see the word 'enriched' in the ingredient list, this product is NOT whole grain. Instead look for words such as 'whole grain', 'stone ground', 'whole ground', 'whole wheat flour', 'whole oat flour', or 'whole barley flour'. These words tell you that a bread product is a whole grain.
- Focus on fiber! Generally, the more fiber a food contains, the lower its impact on blood sugar and insulin levels.
- Always pick whole fruit over fruit juice. Fiber helps slow down the absorption of sugar from foods, and this in turn keeps insulin levels in check!
- Eat beans! Beans are nutrition power-houses. They contain healthy fiber and disease fighting nutrients. Plus, beans are terrific complex carbohydrates. They provide energy *without* raising blood sugar or insulin levels in the body.
- Read labels. Scan the first 4-6 ingredients in the list. The higher an ingredient is listed the more of it you find in the food. If you see terms such as corn syrup, high fructose corn syrup, sugar, brown sugar, or cane sugar near the top of the ingredient list, this food is likely to be higher in simple carbohydrates.

Lentil Quinoa Salad



A quick and easy whole grain salad packed with the “right kind” of carbohydrates. Rich in fiber, whole grains and nutrients and oh so yummy too. ENJOY!

Ingredients

2 cups cooked lentils
2 cups cooked quinoa
1 bunch lightly steamed (and cooled) asparagus; cut into 2" pieces
 $\frac{1}{2}$ cup olive oil
 $\frac{1}{4}$ cup red wine (or other favorite) vinegar
2 Tablespoons grated ginger
 $\frac{1}{4}$ cup toasted nuts, chopped
cup fresh mint leaves, chopped
 $\frac{1}{4}$ teaspoon red chili pepper flakes (optional)
Sea salt and black pepper to taste

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Method

Combine lentils, quinoa and asparagus in a large bowl and season with the chili pepper flakes and sea salt and pepper. Whisk olive oil, vinegar and grated ginger together in a separate bowl (until well mixed) and pour over lentil mix. Add the fresh mint, chopped nuts, and adjust seasonings to taste.

Makes 8 (1/2 cup) servings.



Creamy Lemon Pea Soup

Ingredients:

- 1 cup unsalted cashews
- 4 2/3 cup water, divided
- 2 tsp. canola oil
- 1 leek, white and pale parts, sliced thinly
- 2 cloves garlic, chopped
- 1 cup diced cremini or regular mushrooms
- 3 cups of fresh or frozen green peas
- 1 Tbsp. fresh thyme leaves or 1 tsp. dried, plus additional for optional garnish
- 1 tsp. ground cumin powder
- ¼ tsp. salt, or to taste
- ¼ cup fresh basil leaves
- 2 Tbsp. lemon zest, divided
- Juice of 1 lemon (4 to 6 tsp.)
- ¼ tsp. freshly ground black pepper, or to taste
- Thyme sprigs (optional garnish)

Directions:

- 1) Place cashews in medium bowl with 2/3 cup of the water, which should be just enough to cover them. Let soak while you prepare the rest of the soup, or for 2 hours if time allows.
- 2) In a large saucepan, heat oil over medium heat. Add leek, garlic and mushrooms and cook for 3 minutes, stirring frequently. Mix in peas, thyme, cumin, and a salt; cook 1 minute more. Add remaining 4 cups water, bring to a boil, then reduce heat and simmer, covered, for 15 minutes.
- 3) Stir basil, 1 Tbsp. of the zest, lemon juice, and pepper into the large saucepan. Remove from heat.
- 4) Transfer cashews and water to a blender or food processor and blend until very smooth. Transfer back to the soaking bowl. Puree the soup in a blender or food processor, or use an immersion blender. Return soup to the pan and stir in cashew cream. Heat over low heat until steaming. Ladle soup into 6 bowls and garnish each with ½ tsp. of the remaining zest and a sprig of thyme, if using.

Serves: 6

Cranberry Spinach Salad



A perfect mix of proteins, fat and carbohydrates, that's loaded with health promoting antioxidants too!

Ingredients

- 1 pound baby spinach, rinsed
- $\frac{3}{4}$ cup dried cranberries (aka craisins)
- $\frac{1}{2}$ cup slivered almonds, toasted
- 2 Tablespoons sesame seeds, toasted
- 1 Tablespoon poppy seeds
- 2 teaspoons minced onions
- $\frac{1}{4}$ teaspoon paprika
- $\frac{1}{4}$ cup Sugar in the Raw (OR) honey
- $\frac{1}{4}$ cup white wine vinegar
- $\frac{1}{4}$ cup cider vinegar
- $\frac{1}{2}$ cup light olive oil

Method

In a large bowl, combine the spinach with the toasted almonds and cranberries. In a medium bowl, whisk together the sesame seeds, poppy seeds, sugar or honey, onion, paprika, white wine vinegar, cider vinegar, and olive oil. Toss with spinach just before serving.

Makes ~ 8 servings.