

The Low-Carbohydrate Craze: Is it a healthy way to lose weight?

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Everywhere you look you can find low-carbohydrate (or high-protein) diet books, foods, advertisements, and even stores. These diets promise fast, effective weight loss and have been around since the 1970s. Many Americans have testified to their effectiveness—at least for the short-term—and have readily embraced them. Health professionals, on the other hand, have remained skeptical because of their potentially harmful effects. So, what is the skinny on low-carbohydrate diets? This fact sheet provides an overview of two of the most popular diets, along with the pros and cons of weight loss and health with these diets.

What are low-carbohydrate diets?

The meaning of “low carbohydrate” varies from diet to diet. Some diets recommend extreme restriction of all carbohydrates, while others merely limit carbohydrates to primarily whole grains. What “low carbohydrate” means really depends on the diet and how it is followed. Two of the most popular diets, the Atkins and South Beach diets, show this contrast.

Dr. Atkins' New Diet Revolution™

The main objectives of the Atkins Diet are to remove “carbohydrate cravings,” “reset” the body’s metabolism, and induce fat loss by eliminating carbohydrate-containing foods. The premise is that all carbohydrate-containing foods, regardless of whether they are high in fiber, contain whole grains, or have vitamins and minerals, are responsible for weight gain because of the way they affect blood sugar and the hormone insulin. Insulin regulates blood glucose levels and is released by the body after a person eats carbohydrates. The diet contends that insulin, not the types or quantity of foods, leads to an imbalanced metabolism and, ultimately, to fat storage.

As a result, the diet recommends limiting breads, pasta, rice, potatoes, fruit, and starchy vegetables (corn, peas), and sugar-

filled sweets. The diet replaces them with high-protein foods such as beef, chicken, pork, eggs, and fish and high-fat foods, such as heavy cream, butter, salad dressing, and oils because protein and fat do not stimulate the release of insulin. In the first phase (the first two weeks), called “induction,” dieters are to restrict carbohydrate intake to ≤ 20 grams per day. The book provides a list of foods and their carbohydrate content. Table 1 has a list of some examples. Consider which of these foods you would need to eliminate in the first phase of the diet.

Carbohydrate craving:
An unscientific term to describe when a person desires carbohydrate-rich (starchy) foods and snacks, as well as sweets.

Table 1: Number of grams of carbohydrates in common foods

Hard white roll: 30	Pancake: 15
Corn flakes (1 cup): 26	Corn tortilla: 10
Bran cereal (1 cup): 46	Slice of whole wheat bread: 13
Baked potato with skin: 51	Biscuit (2 oz): 27
Orange juice (1 cup): 25	Banana: 35
Broccoli (1/2 cup), fresh: 2	Black-eyed peas (1 cup): 45
Tomato sauce (1/4 cup): 4	Lettuce (1/2 cup): 1
Boiled corn (1/2 cup): 20	Peas (1/2 cup): 10
Low-fat milk (1 glass): 12	Flavored nonfat yogurt (1 cup): 40

Carbohydrate-containing foods that are allowed include some vegetables and leafy greens. After two weeks, dieters can increase their carbohydrate intake by 5 grams per week until weight loss stops and then start to increase by 10-gram increments as weight maintenance is sustained. Other foods allowed over time include some nuts, berries, and vegetables.

The South Beach Diet™

Similar to Atkins, the South Beach Diet also focuses on removing “carbohydrate cravings” and promoting weight loss by removing carbohydrates and allowing high-protein, high-fat foods during the first two weeks. Unlike the Atkins diet, the South Beach Diet does not limit carbohydrate intake or allow unlimited consumption of high-protein, high-fat foods after the first two weeks. Instead, carbohydrates are “re-introduced” with a modified diet that includes small portions of carbohydrates, such as whole-grain products (breads, cereals, and pastas), that are high in fiber and have a “low-glycemic index.” The diet also encourages proper portion sizes and high-fiber vegetables and nuts.

Low-glycemic index:
A scientific term meaning that it takes longer to break down carbohydrates in the food into simple sugars so they can enter the blood stream.

What are the benefits?

Weight Loss

One of the biggest benefits of low-carbohydrate (high-protein) diets is *short-term* weight loss. This is one reason that they have been so successful. In fact, compared to a traditional low-fat, high-carbohydrate, low-calorie diet, these diets have been shown to result in greater weight loss in studies lasting *less than six months*. In a few studies carried out for one year, dieters on the Atkins diet lost more initial body weight compared to the low-fat group and at the end of six months. At one year, however, the Atkins diet group gained back more weight compared to the low-fat diet group with the end weight loss being similar for the two groups at the end of the studies.

Many scientists argue that the short-term greater weight loss for individuals on the Atkins diet is due to fewer calories, not necessarily because of the lack of carbohydrates. Weight loss may also be in the form of muscle, not fat.

Cholesterol

Diets high in saturated fat and dietary cholesterol are known to raise LDL, “bad” cholesterol, and lower HDL, “good” chole-

sterol, in long-term studies. Although low-carbohydrate (high-protein) diets typically include foods high in saturated fat and cholesterol, to date, studies have indicated that they do not positively or negatively change total cholesterol, LDL cholesterol, or HDL cholesterol in *short-term* studies. These diets do have a positive impact on triglycerides. Levels went down in all reported studies. High triglycerides in combination with low HDL cholesterol levels are risk factors for heart disease.

LDL = “Bad” cholesterol; High LDL linked to higher risk of heart disease

HDL = “Good” cholesterol; High HDL linked with lower risk of heart disease

See *Know Your Cholesterol Number*, Virginia Cooperative Extension publication 348-018, for more information.

In this case, weight loss, not the saturated fat and cholesterol in the diet, may be the reason that cholesterol is not changed. It is unclear what would happen to cholesterol levels if the diet were followed over an extended period of time.

What are the disadvantages?

There are several questions and concerns raised about low-carbohydrate diets that you should be aware of before starting a low-carbohydrate diet.

What foods are *not* part of low-carbohydrate diets?

One of the biggest concerns with restrictive, low-carbohydrate diets is the elimination of certain foods and food groups. There are definitely some foods in each food group that offer more nutrients than others, such as whole-grain foods versus refined grains like white bread and sweet rolls. Still, there are numerous studies showing that healthy choices and sensible portion sizes from all of the food groups of the Food Guide Pyramid, combined with physical activity, help achieve a healthy weight – and promote lifelong health. Protein and fat alone cannot provide you with the nutrients you need for good health, which is not necessarily the same thing as weight loss. Vitamin and mineral supplements are just that – “supplements” – and should not be used as replacements. They do not offer the same benefits as vitamins and minerals obtained from “real” foods.

Following is a list of some of the nutritional benefits that are lost as a result of restrictive carbohydrate diets:

- Breads, cereals, and grains – especially whole grains – provide excellent sources of fiber and B vitamins, like folic acid, which helps promote heart health and prevent childbearing women from having babies with neural tube defects.
- Carbohydrates are the best source of energy for your brain and body, especially if you are active. Protein and fat are not as efficient sources of energy; they need to be converted into energy units that you can use. Many people complain about being fatigued and getting headaches on low-carbohydrate diets because of this.
- Fruits and vegetables are rich sources of fiber, vitamins, minerals, and phytochemicals that help protect against disease. Fruits, despite their numerous benefits, are not recommended in low-carbohydrate diets because they naturally contain sugar.
- Dairy products are excellent sources of calcium and vitamin D for strong bones and teeth, but because they also contain natural sugars, they are also avoided in many diets.
- Nuts provide healthy sources of fat, such as omega-3 fatty acids, which help protect against heart disease.
- Fiber, which is found in most of the foods that are eliminated in low-carbohydrate diets, helps give you the feeling of being full.

Are all fats and high protein foods created equally?

Although many of the low-carbohydrate diets stress the importance of eating proteins and not worrying about fat, it is important to distinguish between healthier and unhealthier choices. High-fat meats, heavy cream, butter, and gravy contain saturated fat and cholesterol, which can contribute to an elevated risk of heart disease. Try to limit saturated fat by choosing lean meats or beans, low-fat dairy products, and fish and nuts that are high in omega-3 fatty acids, considered beneficial for the heart.

The Science Behind the Diet

Unfortunately, many popular diets interpret the existing research and use scientific terms inappropriately to justify their books and programs. For example, some people suffer from insulin resistance or Syndrome X and benefit from

Syndrome X is a term used for someone who is overweight and has: an apple shape; raised blood pressure; and high triglycerides.

A person who is insulin resistant responds sluggishly to insulin.

a diet that is lower in carbohydrates than is recommended by the Food Guide Pyramid. Even among these individuals, just as with the general population, carbohydrates and insulin are not the culprits. Overweight is typically the main contributor, combined with lifestyle behaviors. Typically the side effects are eliminated with weight loss and/or physical activity – without the need to heavily restrict or avoid carbohydrates altogether, but rather replacing refined grains with whole grains and foods high in fiber.

Constipation

Constipation is a common problem for people following low-carb, high-protein diets. Fruits, vegetables, and whole grains provide significant sources of fiber that help maintain regular bowel function. The Atkins diet is not recommended for individuals with chronic gastrointestinal (GI) diseases such as Crohn's, irritable bowel syndrome (IBS), or diverticulitis. Persons with GI diseases need dietary fiber to maintain regular bowel function and to prevent flare ups.

Cancer and Heart Disease

Fruits, vegetables, and whole grains contain many vitamins, minerals, phytochemicals, and antioxidants that repeatedly have been shown to reduce risk for many cancers and heart disease. Low-carb, high-protein diets severely limit the amount of fruits, vegetables, and whole-grain foods you are "allowed" to eat. Plant-based foods are the best choices for disease prevention.

Bone Loss

Calcium is an important mineral for bone health. Inadequate intakes of calcium have been associated with osteoporosis, a disease in which the bones become extremely fragile. High levels of protein have been shown to increase calcium loss from the body, calcium which is thought to come from bone. Nevertheless, short-term studies that measured markers of bone breakdown found high-protein diets do not cause bone breakdown *when* you consume enough calcium. The recommended intake for adults up to age 50 is 1000 mg of calcium per day and 1200 for those 50 and over. Again, it is unclear if bone health would be impacted over time with high-protein diets.

Kidney Function

Kidneys are the main organs responsible for eliminating the by-products of protein metabolism. Many researchers have hypothesized that eating high amounts of protein would put excess strain on the kidneys, which may ultimately reduce kidney function. To date, there is no proof that high-protein diets cause kidney disease or poor kidney function. However, if a person *already has* poor kidney function as a result of untreated or poorly controlled hypertension, for example, then

a high protein diet may cause further kidney damage and is not recommended. You should consult a physician before considering this diet if you have high blood pressure or suspect kidney damage.

Sports Performance

Carbohydrate is the primary fuel that the muscles and the brain use for energy. Diets low in carbohydrates can cause muscle weakness, confusion, dizziness, tiredness, and dehydration—making physical activity less enjoyable. Individuals who participate in endurance activities (activities lasting more than one hour) should *not* consume low-carbohydrate, high-protein diets.

Boredom Level

Lack of variety in food choices and boredom, particularly with the Atkins diet, is a common reason individuals are unable to remain on the low-carbohydrate diets and keep the weight off for the long-term.

When should low-carbohydrate diets be completely avoided?

Highly restrictive low-carbohydrate diets, such as Atkins™ and the first phase of the South Beach diet, are *not* appropriate during pregnancy and lactation or in childhood or the pre-teen or teen years. During these periods of life, growth is very rapid and the body requires calories and several nutrients, such as calcium, folate, and vitamin A, to promote optimal development. Restricting calories and these nutrients could lead to poor growth during these critical years. These diets may hinder the production of breast milk during lactation. The diets also lack dietary fiber which could contribute to constipation, a common problem during pregnancy. Finally, sudden cardiac arrest has also been reported among a few individuals on these diets. Consult your doctor or a dietitian before considering a low-carbohydrate (high-protein) diet.

Low-carb Foods: Buyer Beware

The low-carb diet mania has increased the demand for low-carbohydrate products. In response, many companies have started to produce low-carb food items. Restaurants are also introducing new low-carb menus. Consumers increased their spending on low-carb food items from \$79 million in 2000 to \$334 million in 2003. People should be aware that low-carb, like the low-fat “Snackwell Revolution” in the ’80s, does not mean “all-you-can-eat.” If you decide to follow a low-carb diet for even a short period of time, consider carefully the pros and cons of these newly advertised products when planning your meals and snacks.

- There is no legal definition for “low-carb” foods, meaning that manufacturers can put a “low-carb” label on any food product they make.
- Low-carb does not equal no calories. Many low-carb items are high in calories. For example: A one-ounce low-carb candy bar has 150 calories – similar to a regular candy bar. If eaten daily, these calories can add up over time and lead to weight gain.
- Carbohydrates are replaced with protein, fat, or sugar alcohols. Per gram, protein has the same amount of calories and fat has double the calories of carbohydrate. Low-carb items typically will have either more or the same number of calories as the same food item that is not low-carb.
- The sugar alcohols found in low-carb candy, ice cream, soda, shakes, etc. can cause bloating, cramps, and diarrhea.
- There are no scientific definitions for the claims of “net impact” or “effective carbs.” It is not even clear what these mean.
- Cost! Low-carb products are very expensive. A one-ounce candy bar is ~\$1.00, a seven-ounce box of mashed potatoes is \$6.99, and four servings of Atkins ice cream is \$5.00.
- Menus with low-carb food items do not list the number of grams of carbohydrate. Many meals contain at least 12 grams of carbs—more than half of the recommended number for the induction phase of the Atkins diet.
- Most low-carb products taste worse than their higher-carb replacements.

What are the most effective and healthy approaches to weight loss?

Health professionals need more long-term studies before they can fully endorse low-carbohydrate diets for weight loss and long-term health benefits, even though the diets may be useful to initiate weight loss. If you choose to go on a low-carbohydrate diet, do so for only a short period of time. Then, incorporate whole-grains, fruits, and vegetables to maintain your weight, to increase the variety in your diet, and to minimize any potentially negative health effects like cancer or osteoporosis. The variety of foods will also provide the nutrients you need for good health.

Drastic dietary measures, such as low-carb diets, however, are not needed to lose weight. Research shows that small

changes can result in big impacts over time. Here are some simple ways to lose weight:

- Aim for no more than one to two pounds of weight loss per week.
- Watch portion sizes. Portion distortion is a major reason for the expanding waistlines in America.
- Replace refined cereals like white bread and rolls with whole-grain products like 100% whole wheat bread and pasta and oatmeal.
- Eat “5 to 9” a day of fruits and vegetables. You can eat more for the same number of calories.
- Eat a variety of foods, from all of the food groups. Do not eliminate any food group to lose weight; instead choose low-fat or healthier options in each group.
- Choose healthy drinks, such as water, low-fat milk, or 100% juice. Fruit drinks and soda provide empty calories – meaning calories without nutrients.
- Be active. Physical activity is not only a successful way to lose weight, but to maintain weight loss. It also improves your overall physical and mental health. Aim for at least 30 minutes each day. Any movement can count: walking, biking, swimming, and yoga. Choose something you enjoy doing.
- Get social support from family and friends. Encourage them to provide positive feedback for your weight loss efforts.
- Provide yourself with non-food rewards for meeting small, defined goals.

Other Resources

For more information on related topics, visit the Virginia Cooperative Extension Web site at www.ext.vt.edu

Other related publications

Know Your Cholesterol Number, Virginia Cooperative Extension Publication 348-018

Calcium Checklist: Build Strong Bones, Virginia Cooperative Extension Publication 348-019

Here's To Your Family's Health, Virginia Cooperative Extension Publication 348-025

The Food Guide Pyramid and Dietary Guidelines, Virginia Cooperative Extension Publication 348-710

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