

Carbohydrate Unloading: A Reality Check, Ellen Coleman, RD, MA, MPH

THE PHYSICIAN AND SPORTSMEDICINE - VOL 25 - NO. 2 - FEBRUARY 97

A high-carbohydrate diet makes you fat and hurts your athletic performance. Sounds hard to believe? It is--yet it's the premise of several carbohydrate-bashing diet books currently on the market.

These books (*Enter the Zone*, *Protein Power*, and *Healthy for Life*) all feature diets that supposedly hold the key to lifetime thinness. Their shared theme is that Americans should eat a high-protein diet, instead of the high-carbohydrate diet recommended by most health professionals. Some books even claim that a high-protein, low-carbohydrate diet prevents and treats heart disease, cancer, diabetes, and depression, and in the process, helps us reach peak physical and mental performance.

But do these books provide a better way to eat? No. Carbohydrate-bashing diet books claim that carbohydrates are bad because they raise blood sugar level and cause the release of insulin--a supposedly evil hormone that makes you fat. Insulin, it is said, causes high-carbohydrate food to be stored as fat rather than used for energy. Such claims are due for a reality check.

Reality Check 1: Carbohydrates and insulin don't make you fat.

Insulin isn't a harmful hormone. It's essential for the transfer of glucose (blood sugar) from the bloodstream to the body's cells, where it fuels all activities. What matters in weight loss isn't carbohydrates and insulin, but calories. Getting a high percentage of your calories from carbohydrate doesn't make you fat, because weight depends only on how many calories you take in relative to how many you burn off.

Paying attention to calories is critical for weight control. When people are encouraged to eat more carbohydrate and less fat, some get the wrong message. They think they can eat as much high-carbohydrate food as they want, as long as the food is fat-free. Consequently, they eat too many low-fat sweets and extra-large portions of starches. As a result, they can't lose weight and may feel that carbohydrates have "betrayed" them.

Cutting back on dietary fat does reduce total calories more than cutting back on carbohydrate, because fat supplies more than twice the calories by weight. In addition, fat is more likely to be stored as body fat than is carbohydrate. However, a person who cuts back on fat calories but adds them back in the form of carbohydrate calories is not going to lose weight. It's a simple matter of energy balance that holds true for people whether they're active or not (1).

Reality Check 2: High-protein, low-carbohydrate diets don't increase your ability to burn fat.

No diet will help you gain better access to your body's fat stores during exercise. Carbohydrate, not fat, is the primary fuel for exercise at or above 70% of aerobic capacity, the intensity at which most people train and compete (2). Fat only becomes available for fuel after about 20 minutes of exercise, and most people don't work out long enough to directly burn significant amounts of fat during a workout. But regular exercise can create a calorie deficit that promotes gradual fat loss over the long haul. Further, aerobic exercise raises the level of several hormones that promote greater fat use (2). Therefore, the best way to crank up your body's fat-burning ability is to keep working out (3).

Reality Check 3: High-protein, low-carbohydrate diets aren't the answer for people who are insulin resistant.

About 10% to 25% of all Americans are insulin resistant. These people are likely to have high blood pressure, high blood triglycerides (fatty substances), and a low level of high-density lipoprotein (HDL) cholesterol (the "good" kind), all of which contribute to an increased risk of heart disease. The muscle, liver, and fat cells of these people are less sensitive to the actions of insulin--most likely because they have fewer insulin receptors.

When insulin-resistant people eat simple or complex carbohydrate, the pancreas compensates by dramatically increasing insulin secretion to maintain normal blood glucose levels. According to the carbohydrate-bashers, this oversecretion causes carbohydrate to be stored as fat, and therefore insulin-resistant people are best helped through low-carbohydrate, high-protein diets.

There is no good evidence, however, that insulin resistance or high blood insulin levels make people fat. The truth is that reducing excess weight and increasing physical activity are more important in treating insulin resistance than is the dietary percentage of carbohydrate or fat.

Weight loss and exercise both increase insulin sensitivity, and increased sensitivity results in lower blood insulin levels.(4) Weight loss allows the cells to "recognize" insulin more easily so that less insulin is required. Regular physical activity causes insulin to bind more easily to muscle cell receptors and to promote glucose uptake more effectively (4). Exercise and weight loss combined also have an additional benefit: They lower the risk of heart disease by reducing triglycerides, lowering blood pressure, and increasing HDL cholesterol.

Reality Check 4: High-protein, low-carbohydrate diets are not magic regimens--they're just very low-calorie. You'll lose weight on these diets because of the severe caloric restriction, not because of what is supposedly happening to insulin levels. You'll eventually lose something else, too: your performance and well-being. You need to eat enough calories and carbohydrate to maintain your muscle stores of glycogen--the favored fuel for exercise. Following a low-calorie, low-carbohydrate diet will only put you into a twilight zone of near starvation.

Reality Check 5: You need carbohydrates to perform at your best.

When you eat carbohydrate, the body changes much of it into glucose, the chief source of energy for the body. Glucose that is not needed immediately is stored as glycogen in the liver and muscles for later use.

Although eating carbohydrate 30 to 45 minutes before exercise raises insulin levels and lowers blood glucose, these effects are temporary and will not harm performance. In fact, consuming carbohydrate an hour before exercise can improve performance (5). Carbohydrate feedings 3 to 4 hours before exercise also enhance performance by "topping off" glycogen stores (6). Consuming carbohydrate during workouts lasting longer than an hour aids endurance by providing glucose for your muscles when they're running low on glycogen (7,8). Finally, taking in carbohydrate right after several hours of hard training increases muscle glycogen storage (9).

Active people and athletes require dietary carbohydrate to maintain their muscle-stored glycogen, the predominant fuel for most sports. They gain weight only if they consume more calories than they expend. When this happens, they should blame their forks, not the carbohydrate.

Keep the Right Mix So what's the bottom line on high-protein, low-carbohydrate diets? They supposedly make you a thinner, healthier, and better athlete. What they really do, though, is take the fun out of eating. Almost all professional health groups in the country recommend dietary variety--55% to 60% of calories as carbohydrate, 10% to 15% as protein, and the remainder as fat. And variety at the table adds spice to an active life.

References

1. Entering a high protein twilight zone. Tufts University Diet & Nutrition Letter 1996;14(3):4-6
2. Gollnick PD: Energy metabolism and prolonged exercise, in Lamb DR, Murray R (eds): Perspectives in Exercise Science and Sports Medicine, Vol 1: Prolonged Exercise. Indianapolis, Benchmark Press, 1989, pp 1-36
3. Coyle EF: Fat metabolism during exercise. Sports Sci Exch 1995;8(6):1-6
4. Is pasta now on the 'out' list too? Tufts University Diet & Nutrition Letter 1995;13(3):4-6
5. Sherman WM, Peden MC, Wright PA: Carbohydrate feedings 1 hr before exercise improve cycling performance. Am J Clin Nutr 1991;54(5):866-870
6. Sherman WM, Brodowicz G, Wright DA, et al: Effects of 4 hr preexercise carbohydrate feedings on cycling performance. Med Sci Sports Exer 1989;12(5):598-604

Ms Coleman is the nutrition consultant at The Sport Clinic in Riverside, California. She is a two-time finisher of the Hawaii Ironman triathlon and author of *Eating for Endurance*, 3rd edition (Palo Alto, CA, Bull Publishing, 1997).