

## The Energy Lift in Sports

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### What are Carbohydrates?

Carbohydrates, or “carbs,” are one of the three macronutrients that provide calories, the others being protein and fat. The carbs can be classified as either “simple” (sugars such as table sugar and honey) or “complex” (starches such as bread).

Foods high in carbohydrates are potatoes, cereals, pancakes, waffles, breads, bagels, spaghetti, macaroni, rice, grains, fruits, and vegetables.

### Importance of Carbohydrates

The primary function of carbohydrates is to furnish energy, especially during intense activity. This is true regardless of whether an athlete is participating in a sport, engaging in conditioning activities, or lifting weights.

The body breaks down carbohydrates into glucose (or blood sugar), which can be used as an immediate form of energy during physical activity or stored for future use as glycogen in the liver and muscles.

Highly conditioned muscles can stockpile more glycogen than poorly conditioned muscles. If the glycogen stores are depleted, an athlete will feel overwhelmingly exhausted. For this reason, a greater supply of glycogen stores can give the athlete a significant physiological advantage.

Foods can be described by the effects they have on blood glucose. Those that produce a considerable increase in blood glucose are high-glycemic foods. Those that produce a negligible increase in blood glucose are low-glycemic foods. Because carbohydrates play such an important role as a source of energy, it's important for athletes to consume adequate amounts of it. And nowhere is the intake more critical than before and after physical activities.

### Pre-Activity Foods/Fuels

Before an activity, any foods that athletes consume should satisfy their hunger and ready their bodies with fuel. It's best to consume foods that are high in carbohydrates and will keep their blood glucose within a desirable range.

High-glycemic foods shouldn't be consumed before an activity. Fact: In response to a high level of blood glucose, the body increases its level of blood insulin. As a result of this hormonal balancing, the blood glucose is sharply reduced.

This leads to hypoglycemia (or “low blood sugar”), which decreases the availability of blood glucose as a fuel and causes the athlete to feel severely fatigued. Although this condition is usually temporary, it remains an important consideration.

Don't just simply assume that a sugary food raises blood glucose more than a starchy food. Indeed, honey raises blood glucose less than a bagel and, given these two options, would be a better choice prior to an activity.

Examples of pre-activity foods/fuels that have a low glycemic effect include milk, apple juice, orange juice, tomato juice, cherries, grapefruit, grapes, pears, plums, yogurt, macaroni, plain pizza, spaghetti, beans, nuts, and oatmeal.

#### Post Activity Foods/Fuels

After an activity, especially an intense one, proper nutrition will accelerate recovery and better prepare the athlete for their next physical challenge. The idea is to replenish the depleted glycogen stores and to expedite the recovery process as soon as possible after training or competing.

Following an activity, it's best to consume foods that are high in carbohydrates that will restore the muscle glycogen in the quickest fashion.

Examples of post activity foods/fuels that have a high-glycemic effect include sports drinks, bananas, watermelons, raisins, rice cakes, cereals, pretzels, white rice, baked potatoes, white or rye bread, bagels, pancakes, and waffles.

According to Nancy Clark, M.S.R.D., the internationally known sports nutritionist and author, athletes should consume 0.5 grams of carbs per pound of their body weight within two hours of completing an intense activity. This should be repeated again within the next two hours.

For instance, a 150-pound wrestler needs to consume about 75 grams of carbohydrates – or 300 calories of carbohydrates- within two hours after an intense activity and another 75 grams during the next two hours.

#### Addressing the Controversy

Given the seemingly obvious importance of carbohydrates, why have they been cast as “villains”? Much of the reason is based upon the myths feed to coaches and athletes.

Myth: The best pre-game meal is steak and eggs.

Reality: One of the worst pre-game meals is steak and eggs. This is because foods that are high in fat and protein, such as steak and eggs, are digested slowly.

Understand that no foods consumed before competition will lead directly to a great performance. Certain foods should be avoided, however, such as greasy, highly seasoned and flatulent (gas-forming), along with any specific foods that an athlete may find distressful to his or her digestive system.

Needless to say, the athlete should not experiment with new foods before the big game. The pre-game meal should almost be bland, yet appetizing enough to appeal to the athlete.

Myth: All carbohydrates are bad.

Reality: Some carbohydrates are bad. The banana is a rich source... but so is soda. Carbohydrates that are more nutritious include fruits, vegetables, and whole grains; they're full of vitamins and fiber. Carbohydrates that are less nutritious include processed foods such as cakes, cookies, and muffins along with soft drinks and candy; they're full of “empty” calories.

Myth: Carbohydrates will make your athletes fat.

Reality: Eating too much and exercising too little will make your athletes fat. Weight management boils down to the number of calories that are consumed and the number of calories that are expended.

If more calories are consumed than expended, it will produce an increase in weight. If the increase in weight is magnified, at least some of it will be in the form of fat rather than muscle.

This holds true whether the excess calories come from carbohydrates, proteins or fat. Any carbohydrates that exceed the athlete's daily needs will be stored in the body as fat. Protein in excess of daily needs also will be stored as fat. And of course, any fat that is in excess of daily needs will be stored as fat.

Myth: Eating a high-glycemic food such as a potato, will increase appetite.

Reality: There is no conclusive evidence whatsoever that eating a high-glycemic food increases appetite or, for that matter, makes someone gain weight. When was the last time you saw someone sit down at a table and eat a plateful of baked potatoes? When someone sits down for a meal, a variety of foods are on the plate. Usually vegetables and a meat, fish, or poultry choice. There may also be a salad and something to drink such as a glass of milk. These foods would balance out any, or dilute, any glycemic effect from the baked potato. So, even if high-glycemic foods make someone hungrier, the rest of the meal will usually contain a variety of foods that will soften the effect.

Also keep in mind that the glycemic effect is unrelated to portion size. Eating a small amount of a high-glycemic food actually has a less significant impact upon blood glucose than eating a large amount of it.

Myth: When selecting foods it is important to consider "net carbs."

Reality: In response to the carbohydrate paranoia, many manufacturers have been using the term "net carbs" (as well as "effective carbs" or "impact carbs") on the packaging of their food products, though not on the nutrition labels. The food industry calculates "net carbs" by taking the total grams of carbohydrates per serving and then subtracting the grams of fiber and sugar alcohols, which are neither sugar nor alcohol, but sweeteners.

Food manufacturers claim that because fiber isn't digested and sugar alcohols have a negligible effect on blood glucose, they do not count. It's true that fiber passes through the digestive system largely intact and sugar alcohols have a minimal impact on blood glucose. But here is where the math gets fuzzy: Sugar alcohols have calories and, thus, "do count."

Understand that "net carbs" is an unscientific term that's calculated in a subjective way. Clearly it was invented and implemented by the food industry to capitalize on the low-carbohydrate frenzy.

At the present time, "net carbs" and other popular terms that are used on product packaging, such as "low-carb" – haven't been dignified or even recognized by the Food and Drug Administration, which, by the way, is why they do not appear on the nutrition label.

Risk of Low-Carb Diets

If the amount of carbohydrates that are consumed is decreased, then, the amount of protein and fat that are consumed must be increased. This will restrict the intake of foods that contain highly valuable nutrients, such as fruits, vegetables, and a whole-grain products – which may lead to vitamin and mineral deficiencies.

Since fewer carbohydrates are available as a source of energy, an athlete will also fatigue more quickly during physical activities. There is no doubt that athletes who eliminate or trim carbohydrates from their diets will have less stamina and endurance when training and competing.

It is important for athletes to consume carbohydrates to fuel their active lifestyles. Remember, that main function of carbohydrates is to supply energy, especially during intense activity.

The other two macronutrients- fat and protein- have major limitations as energy sources. Fat is an inefficient source of energy, so it is preferred during low intensity efforts when there is no need to be efficient.

Protein is actually a last resort since it's located in the muscles and if an athlete is in a situation where it must be relied upon as an energy source, then the muscle tissue is literally being cannibalized.

But most importantly, the long term safety and effectiveness of low-carb diets are unknown. One thing is certain, though: Diets that are low in carbohydrates and high in protein and fat pose significant health risks. It's important to note that consuming too much protein and fat is associated with a greater risk of heart disease. Excreting an excess amount of protein stresses the liver and kidneys. Does it really make sense that in order for an athlete to lose fat he or she should eat more of it?

#### The Bottom Line

The importance of consuming adequate carbohydrates is unmistakable. How much is enough? At least 65% of an athlete's daily calories should be from carbohydrates.

Clearly, carbohydrates are miscast villains.