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Not all carbs are created equal

By Ilana Katz M.S., R.D., L.D.
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Carbohydrates are the building blocks of all plant life. They include fruits, vegetables, grains and starches. Note that "carbs" are expressed in plural, because there are different types, and different carbs are treated differently by our bodies with varying nutritional values.

Some carbs are digestible while others aren't; some are considered complex, while others are simple; and some contain soluble fiber while others contain insoluble fiber.

However, nearly all carbs we consume are converted into glucose (blood sugar) with the notable exceptions of fiber and glycerin. The basic carbohydrate for human nutrition is the simple sugar glucose, but our bodies also make a complex carbohydrate called glycogen, the storage form of glucose in the muscles and liver.

Some carbs are high in sugar and digest quickly for immediate energy, while others digest slowly and provide a more controlled release of energy. Given these differences, it's important to consider which carbs are the best for different circumstances such as training and racing.

Athletes require carbs during both high- and low-intensity workouts, but carbs are depleted more quickly during intense activity. Depletion of carbs results in fatigue and rapidly declining performance. When glucose runs out, the athlete stops, or "hits the wall," so it's important to replace carbs at every opportunity to avoid this state.

Making the right choice at the right time

Carbohydrates consumed before, during and after workouts are utilized differently. Carbs consumed before activity can top off energy stores and delay fatigue; during activity they help to maintain blood sugar to fuel muscles; and post-workout they aid in recovery and glycogen replenishment.

Simple carbohydrates, or monosaccharides (sugars), are derived naturally from many foods, including glucose, fructose (typically found in fruits and vegetables), galactose (a milk sugar), sucrose (table sugar), lactose (another milk sugar) and maltose (grain sugar). Simple carbs provide a quick boost of glucose to the blood stream. These are often used by endurance athletes to sustain glucose levels for greater periods of time -- they're readily available and digestible.

Complex carbs, or polysaccharides, contain many molecules of connected monosaccharides. Polysaccharides can be either digestible (starch, dextrins and glycogen), or indigestible (cellulose, hemicellulose, pectin, gums and mucilages).

Dietary fiber, a non-digestible carb, is useful because it may lower fat and cholesterol absorption, moderate blood sugar and reduce the risk of colon cancer and heart disease. So, outside of training, focus on eating more complex carbs overall in your diet. Complex carbs are essential for replenishing glycogen and overall athletic performance.

An athlete's ability to store glycogen is determined by conditioning, hydration and the availability of an enzyme (glycogen synthetase) to convert glucose into glycogen. This enzyme is elevated after exercise -- highest within 30 minutes post-exercise, but remains elevated for 24 hours. So eating an adequate amount of complex carbohydrates within this 30-minute window is ideal for glycogen replenishment. Furthemore, adding a small