

Energy Gels Simplified (we hope)

Athletes need carbs to maintain blood glucose levels for muscle energy. In a typical study of carbs and athletes, cyclists rode vigorously for three hours, during which time they consumed either 8 oz. of plain water or water plus 25g of carbs every 30 minutes. Then, the speed was increased. At near-sprint pace, those who took in carbs endured for an average of 33 more minutes, while the water-only group lasted just two more minutes.

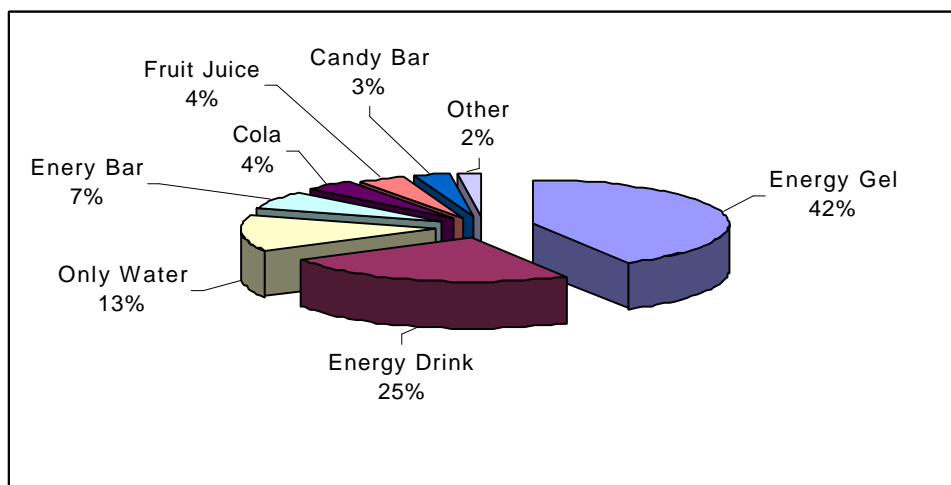
Carbohydrate gels are the latest/greatest in carbohydrate supplementation because of their convenience and ease on the digestive system. Think of them as an energy pudding. They come in easy-to-carry packets (like fast-food ketchup), allowing you to take in extra carbs whenever you have a water source available (i.e., race aid stations, water fountains, etc.). (Remember, no carbohydrate should be taken without water, since highly-concentrated carbs are absorbed slower than those that are diluted slightly.) Gels are great because they contain no solids and are thus absorbed very quickly. In short, they won't get the rest of your digestive tract working while you're trying to run! A gel packet contains 25-28g of carbohydrate and is best taken 20-30 minutes before your run and every 45 minutes or so during.

The growth of the carbohydrate gel market has grown exponentially since their introduction in the mid 90's. Both serious and recreational athletes alike have traded in their energy bars for the convenience, ease of digestion and added benefits of gels. As nationwide participation in many endurance activities continues to grow and other sports (like tennis, weightlifting, etc.) begin to realize the benefits that a gel offers, the demand for high quality carbohydrate gels show no sign of slowing down.

Many athletes prefer gels over sports drinks and energy bars because gels provide a super concentrated dose of carbohydrate that is absorbed very easily into the bloodstream. They provide a steady and continuous delivery of energy during periods of peak performance. Additionally, gels are attractive because they are not "heavy on the stomach" and are unlikely to cause gastrointestinal distress. Each gel pack provides enough carbohydrate to supply about 30 minutes of energy during physical activity. They offer the athlete a palatable, super fast, and easily digested fuel supply.

Just remember, the consumption of energy gels during exercise is not sufficient to replace the water lost from sweating in order to combat dehydration. It is very important that individuals participating in strenuous exercise drink enough fluid to stay hydrated. According to the American College of Sports Medicine (ACSM), it is recommended that individuals drink 20-40 ounces per hour in order to replace sweat/fluid loss. In addition to concerns about dehydration, insufficient levels of water intake may slow down the intestinal absorption of carbohydrates. It is recommended that roughly 8-10 ounces of water or a sports beverage be consumed per pack of energy gel.

Preferred Source of Carbohydrate During a Marathon



Ingredients Found in Gels

Maltodextrin-is an easily digestible complex carbohydrate made from natural corn starch and is the preferred carbohydrate used in energy foods due to its solubility, low taste profile and quick absorption.

Fructose-the principal sugar in fruit. Works in conjunction with maltodextrin to provide energy. Fructose is absorbed rapidly, but utilized more slowly than glucose.

Amino Acids-proteins which build and restore muscle tissue. They also play an important role in maintaining focus and concentration.

-*Leucine and Valine*-branched chain amino acids which provide up to 5% of the calories burned during exercise. Endurance activities can lead to deficiencies in blood leucine which the body tries to restore by degrading muscle.

-*Histidine*-acts as a buffer to slow the buildup of lactic acid

Caffeine-in controlled amounts, caffeine stimulates the central nervous system, increases the release of adrenaline, and aids in the use of body fat as fuel. Over 85% of all studies focusing on the use of caffeine among athletes demonstrate that caffeine offers significant advantages. In studies, caffeine has been shown NOT to cause dehydration when consumed during exercise. The 40mg of caffeine in most gels is equal to about ½ cup of coffee.

Antioxidants-protect tissues by neutralizing free radicals which are produced by the muscle's use of oxygen during exercise.

-*Vitamin C*

-*Vitamin E*

Pectin-a natural fiber without bulk that controls the absorption of ingredients from the gut.

Electrolytes

Critical to peak performance, electrolytes such as sodium, potassium and magnesium are essential in metabolizing carbohydrates and for the proper functioning of muscles.

-*Sodium* - Studies indicate that rehydration occurs at a faster rate when electrolytes such as sodium are consumed during exercise.

-*Potassium* - This mineral is the major electrolyte found in all of your body's cells. It plays an important role in the transmission of signals to nerve impulses, muscle cell contraction and overall maintenance of your cardiovascular system.

-*Magnesium* - Not only is it essential for the efficient metabolism of carbohydrates, research has shown that athletes have a higher-than-average rate of magnesium deficiency. Muscle cramps and tremors may signal a magnesium deficiency

Calcium Carbonate-an easily absorbed form of calcium which plays a large role in muscle contraction.

Drink water. Drink a few mouthfuls of water with your gel. It will help your intake of the 110-120 calories of energy producing carbohydrates in each packet.

Trial run. Ideally, you should first test the effect that any gel has on you in training before using it in a race. Since everyone expends energy at different rates, you'll want to experiment with just how far a packet of gel will take you. You may also want to try out different brands and different flavors to see which works best.

Breakdown of the Brands



GU-The first energy gel on the market (hence the reason a lot of energy gels are called GU generically, like Xerox for copies and Kleenax for tissue). Developed by Dr. William Vaughan who was disappointed in how energy bars were not working for his daughter Laura, an ultra runner. Laura needed a way to maintain her energy on long runs but was bothered by the stomach problems caused by solid foods and energy bars. Based on her needs, Dr. Vaughan began experimenting with carbohydrates in gel form. After extensive testing and trial use by elite athletes, GU was perfected and release in 1991.

All GU contains maltodextrine, fructose, the GU Herbal Blend; caffeine, chamomile (anti-inflammatory properties) and ginseng (enhances energy production), Leucine and Valine, GU Antioxidant Blend; vitamins E and C, Histidine, Potassium and Sodium Citrate, Pectin, Sea Salt (natural source of sodium), Calcium Carbonate.

All six flavors-Just Plain, Tri Berry, Banana Blitz, Vanilla Bean, Chocolate Outrage and Orange Burst-are 1.1 oz., contain 100 calories, and with the exception of Chocolate Outrage, are no fat and contain 25g of carbohydrates. Chocolate Outrage has 20g of carbohydrates and 2g of fat. Banana Blitz is caffeine free.



Carb-BOOM- is a gel made with super concentrated complex carbohydrates that is flavored with real fruit and has a more natural taste. Carb-BOOM is specially formulated for easy digestion and fast replenishment of energy during and after strenuous exercise.

All Carb-BOOM contains maltodextrine, fructose, Potassium Sorbate and Sodium Citrate, Sea Salt (natural source of sodium), Calcium Carbonate.

Each packet is 1.4 oz. and comes in four flavors-Apple Cinnamon, Strawberry Kiwi, Banana Peach and Vanilla Orange. All flavors have 127 calories, 27g of carbohydrates and with the exception of Vanilla Orange, are caffeine free.



Clif Shot-comes in 1.1 oz. packages and 5 different flavors: Sonic Strawberry (with caffeine), Mmm... Chocolate, Razz Sorbet™, Viva Vanilla, and Mocha Mocha (with caffeine). All have 0g of fat and 24g of carbohydrates. Clif Shot has the only caffeine free Chocolate on the market. All Clif Shot packages contain brown rice syrup, sea salt, potassium citrate, magnesium oxide, and kola nut extract for those that contain caffeine.



Power-Gel-Each 1.4 oz. Package has 110 (120 for Chocolate) calories. Caffeinated and non-caffeinated flavors, depending on your needs. They come in six flavors: Chocolate, Tangerine and Strawberry Banana containing the PowerBar® PowerGel Booster Blend of caffeine, kola nut extract and ginseng. Tangerine is double caffeinated when you want double the boost. Vanilla, Lemon Lime and Tropical Fruit are caffeine free.

Hammer Gel – comes in 1.25 oz. packages and eight different flavors: Apple-Cinnamon, Banana, Chocolate, Espresso, Orange, Raspberry, Vanilla and Plain. Hammer Gel contains a long-chain maltodextrin and a trademarked sweetener, Energy Smart. This proprietary blend of complex carbohydrates has unique properties that promote maximal conversion to energy. Hammer Gel exits the GI tract quickly and efficiently making it readily available for energy production.

Gel Comparisons

	Carbs(g)	Calories	Caffeine	Fat(g)
GU				
Just Plain	25	100	y	0
Tri Berry	25	100	y	0
Banana Blitz	25	100	n	0
Vanilla Bean	25	100	y	0
Chocolate Outrage	20	100	y	2
Orange Burst	25	100	y	0
CarBoom				
Strawberry Kiwi	27	107	n	0
Banana Peach	27	107	n	0
Apple Cinnamon	27	107	n	0
Vanilla Orange	27	107	y	0
Hammer Gel				
Chocolate	22	90	n	0
Vanilla	23	93	n	0
Espresso	22	90	y	0
Orange	23	91	n	0

	Carbs(g)	Calories	Caffeine	Fat(g)
Power Gel				
Chocolate	28	120	y	1.5
Strawberry Banana	28	110	y	0
Vanilla	28	110	n	0
Tangerine	28	110	y	0
Tropical Fruit	28	110	n	0
Lemon Lime	28	110	n	0
Clif Shot				
Mmm...Chocolate	24	100	n	0
Viva Vanilla	24	100	n	0
Razz Sorbet	24	100	n	0
Mocha Mocha	24	100	y	0
Sonic Strawberry	24	100	y	0
Hammer Gel				
Apple-Cinnamon	23	91	n	0
Raspberry	22	86	n	0
Banana	22	88	n	0
Plain	23	93	n	0