road cycling

race faster
nutrition guide

sportive

time trial

stage racing

carbo loading

training

HIGH5

ADVANCED SPORTS NUTRITION

HIGH5 advanced drinks contain

2:1 FRUCTOSE

Have you ever thought
how fast you might ride
and how far you could go ....

√ tested 2009 High5 drinks 5 min 45 seconds faster!

2:1 FRUCTOSE

26 readers from Cycling Weekly took part in a large study run by researchers from the University of Glasgow. Riders following the **High5 Race Faster Guidelines** and using **High5** 2:1 fructose drinks, were substantially quicker than when using their regular brand of nutrition used as the way they normally use it. The average difference during a **40 mile** (64km) **Time Trial** was **5 min 45 seconds.**

The Cycling Weekly reader test were intended to simulate a Cyclo Sportive, Stage Race, or longer MTB event. The tests involved 40 or 50 miles (dependent on rider) completed at moderate intensity, followed by a 40 mile (64km) flat out Time Trial. The tests compared High5 2:1 fructose drinks used as per the High5 race faster guidelines Vs riders normal brand of nutrition, which the test subjects were free to consume as they would normally.

√ tested 2009 High5 drinks 8 min faster and15% more power

2:1 FRUCTOSE

Prof. Hottenrot ILUG Study (2009): in a second independent study which was similar to the Cycling Weekly test but using 18 subjects, riders were on average **8min 12s** quicker over a **40 mile** (64km) **Time Trial** when using **High5** drinks and following the High5 nutrition strategy when compared to using their regular brand of nutrition in the way they normally use it. Average power output during the Time Trial was increased by **15%** when using High5, while body weight remained near constant indicating exceptional fluid replacement.

The ILUG test were intended to simulate a Cyclo Sportive, Stage Race, or longer MTB event. The tests involved a 20 minute warm up, VO2 Max test, a 2 1/2 hour ride at moderate intensity (70% V)2 Max), followed by a 40 mile (64km) flat out Time Trial. The tests compared High5 2:1 fructose drinks used as per the High5 race faster guidelines Vs riders normal brand of nutrition, which the test subjects were free to consume as they would normally.

High5 - research proven drinks that let you ride faster and further

DRUG FREE see note [4]

[4] Some High5 products contain caffeine. EnergySource X'treme may also contain Citrus Aurantium (Synephrine). These substances are in the 2009 WADA monitoring program, but are not considered as prohibited substances. However, there may be special regulations applied by your sporting body and the WADA regulations may change.

your sports nutrition should provide:

1. carbohydrate

This is the fuel that lets you race both fast and far. 70% of the effort required for a 2:45 to 3:45 marathon is fueled by carbohydrate and not fat. Unfortunately, your body can only store a limited amount of carbohydrate - typically 400g for a 75kg athlete when rested. Race anything over 90 minutes and your carbohydrate store can be depleted.

Any carbohydrate that you are able to consume during a race (drinks, gels etc) adds to your body's store of carbohydrate. **High5's** new generation of sport drinks with a **2:1 fructose** ratio can provide your working muscles with up to 90 grams of carbohydrate per hour. That's 50% more than the best traditional [5] sport drinks can provide.

2. fluids

For optimum performance, you should aim to replace sweat loss by consuming sports drinks. Racing in the heat, it's hard to drink enough to keep up with sweat loss. In hot conditions, you can sweat more than 1.5 liters per hour, the equivalent of two large drink bottles.

The **2:1 fructose** formulation found in **High5** drinks has been shown to deliver fluids faster than traditional sport drink formulations. **High5** drinks also contain a relatively high level of key electrolytes.

[5] A traditional sports drink refers to a drink formulated with glucose, dextrose, maltodextrine or any other carbohydrate that breaks down to glucose during digestion and before absorption into the blood stream and a drink which contains little or no fructose.

3. caffeine

in moderate doses can substantially increase the absorption of carbohydrate and fluids. Caffeine also stimulates the body's nervous system: reducing fatigue, making you more alert, increasing your concentration and reducing the feeling of effort during sport. In the right amount (3mg to 6mg caffeine per kg of body weight), caffeine is an effective performance enhancer. A moderate dose of caffeine has not been shown to significantly increase dehydration during sport.

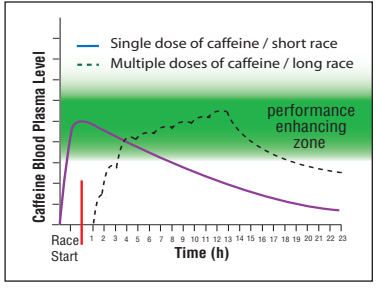


Fig 1. caffeine blood plasma levels over time

If you are sensitive to caffeine and experience symptoms such as hand tremors, heart palpitations etc., then stop using it immediately. If you have a heart condition do not use caffeine. You can continue to follow these guidelines by switching from products containing caffeine, to the equivalent products with no caffeine.

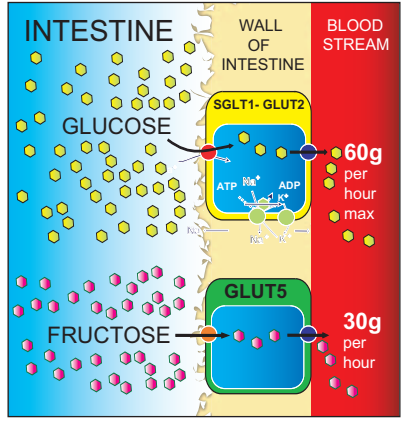
The different types of carbohydrates used in traditional sport drink formulations are first broken down to glucose by your digestive process.

That *glucose* then passes through the wall of your intestine into your blood stream. To pass through the wall of your intestine, the *glucose* molecules use "revolving doors" known as the *glucose* transporters.

the science behind High5 2:1 fructose drinks

As these revolving doors only allow *glucose* to pass slowly, they limit the amount of carbohydrate your body is able to absorb to **60 gram per hour**. For many years, that was thought to be the upper limit to the amount of carbohydrate you could absorb - but not any more.

High5 drinks with their new **2:1 fructose** formulation can now deliver up to **90 gram** of carbohydrate per hour. Fructose (fruit sugar) is a unique carbohydrate, which is not broken down to *glucose* by digestion. It passes through the wall of the intestine using a different set of doors to *glucose*.



Absorption of combined glucose and fructose

High5 new drinks contain **2 parts maltodextrin** (a traditional type of carbohydrate that breaks down to glucose during digestion) and **1 part fructose**. You can see from the diagram that **90 gram** of this 2:1 combination can be absorbed per hour. As carbohydrate is the fuel for speed and endurance, the more you have available the faster and further you can ride.

Most traditional sport drinks and gel contain no fructose or relatively low levels. High5 drinks contain around 33% or more fructose [6].

NB: The 2:1 fructose formulation simply allows you to absorb more carbohydrate than was previously possible. **To benefit from it you must eat and drink more than you would normally.**

[6] High5 drinks containing approx. 33% or more fructose are: EnergySource, EnergySource 4:1, EnergySource X'treme and Isotonic

Dave: *"Not only was I near the front for the duration of the race, I even felt brave enough towards the end for a lone attack. My team mates and others thought the pace was very fast and were astonished by my transformation".*

Mark: *"I am not really fussed by the 7½ minutes I took out of the time trial, but the improvement in comfort is worth a great deal to me and is the equivalent to being able to ride home with some kind of style (or not) after a long ride / sportive. I am a High 5 convert!"*

Ryan: *"Wow! it really worked, I did the 110 miles & 7000 ft of climbing 30 mins faster than my team mate, who is normally quicker than me.*

Patrick: *"I knocked over 20 minutes off my PB for a 62 mile ride".*

To race fast, to ride far and to finish strong you need:

- To maximise carbohydrate intake during your race
- To minimise dehydration
- To load with an exact dose of caffeine

To achieve these three things, you will need a customized strategy for every competition dependent on **your** race distance, the amount **you** are able to drink (race temperature) and **your** body weight. In the following guidelines, the ultimate nutrition strategy for every event has been worked out for **you.**.

get to know your best friends...

EnergySource

The main drink for racing and everyday training.

flavours: orange, citrus, summer fruits and tropical. √ 2:1 fructose √ exceptional fluid replacement / high in electrolytes √ no stomach problems X no caffeine

EnergySource 4:1

4:1 is standard EnergySource with whey protein isolate added. It's the ultimate drink for training, distance racing, supporting large increases in weekly mileage (eg. a training camp), core strength training and speed work.

flavours: orange and summer fruits. √ 4:1 whey protein isolate (CFM & lactose free)
√ 2:1 fructose √ no stomach problems √ exceptional fluid replacement / high in electrolytes X no caffeine

EnergySource X'treme

X'treme is standard EnergySource with a high level of caffeine (150mg per 500ml). Use to: caffeine load prior to an event, as a pre training get-up-and-go drink, to increase the intensity of power sessions and to recover when you go off-the-back during a longer ride. Use X'treme as directed, you cannot use it as you would a normal sports drink.

flavours: citrus. √ 2:1 fructose √ high electrolyte anti-cramp √ no stomach problems √ high in caffeine

Protein Recovery

Protein Recovery is designed for total recovery after exercise. Mix with water (fast release) or milk (slow release for overnight feeding). EnergySource 4:1 can be used to effectively recover after exercise, but Protein Recovery is the more complete recovery product.

flavours: banana, chocolate, summer fruits. √ 21/2:1 ratio of whey protein isolate (CFM) √ slow or fast release
X does not contain caffeine

choose your gel...

EnergyGel

EnergyGel is more concentrated, so lighter in weight and easier to carry in larger numbers than IsoGel (below). EnergyGel does not contain 2:1 fructose, as it would be very sweet if it did.

flavours: orange, banana, summer fruits, apple and citrus. √ not too thick or sweet √ light real juice flavours **X** not 2:1 fructose **X** no caffeine.

IsoGel

You do not need to drink additional water with IsoGel. It's lighter. Less sweet and easier to swallow than EnergyGel. In the following guide, you can substitute one sachet of IsoGel for one sachet of EnergyGel. IsoGel is, however, more bulky to carry.

flavours: orange and berry √ do not need to drink additional water √ not thick or sweet √ very light real juice flavours **X** not 2:1 fructose **X** no caffeine

EnergyGel Plus

EnergyGel Plus is the same as standard EnergyGel but with 30mg of caffeine added per sachet.

flavours: orange plus, raspberry plus, √ 30mg caffeine per sachet

IsoGel Plus

IsoGel Plus is the same as standard **IsoGel**, but with added caffeine (30mg per sachet).

flavours: citrus plus. √ 30mg caffeine per sachet

Goodie Bag & Gel Flask

Goodie bag fits behind the stem and is aerodynamic and secure. **Gel flask** holds up to 4 EnergyGel sachets and can be used one-handed.

an optimum nutrition strategy for

time trial
sportive
stage racing

10/25 mile time trial, crit, cyclo cross

90 minutes before - caffeine load:

Drink one 750ml bottle of EnergySource X'treme 90 minutes before your race starts. At the same time take the following EnergyGel Plus sachets based on body weight:

50kg to 60kg: 1 x EnergyGel Plus
60kg to 70kg: 2 x EnergyGel Plus
70kg to 90kg: 3 x EnergyGel Plus

during your race:

If your ride is less than one hour: swill EnergySource around your mouth for a few seconds and spit it out (like mouth wash). If you swallow it does not work.

Repeat every 5 to 10 minutes. If it's hot or your race lasts more than one hour, ignore this advice and instead start drinking EnergySource 10 minutes before the start and during your race.

recovery after:

To re hydrate, refuel and to help increase the development of lean muscle: drink 500ml to 1000ml of EnergySource 4:1 after you finish.

note: You can substitute IsoGel Plus for EnergyGel Plus if you wish.

50/100 mile time trial

try in training before you race

60 to 90 minutes before - caffeine load:

Drink one 750ml bottle of EnergySource X'treme in the period 60 to 90 minutes before your race starts. At the same time take the following number of EnergyGel Plus sachets based on body weight:

50kg to 60kg: 1 x EnergyGel Plus
60kg to 70kg: 2 x EnergyGel Plus
70kg to 90kg: 3 x EnergyGel Plus

10 minutes before the start:

Drink 200ml to 500ml EnergySource. This counts towards the drink you have consumed in the first hour.

during your race:

Focus on drinking as much as possible. Your body is able to absorb more than 90g per hour of the 2:1 fructose mix found in EnergySource.

Depending on how much you are able to drink, you may need to take gel to further boost your carbohydrate intake. If you drink the following amounts of EnergySource each hour, also take the number of gels shown:

800ml to 1200ml	no gel
600ml:	1 x EnergyGel Plus
400ml:	2 x Gels
200ml:	3 x Gel

The first gel each hour should be EnergyGel Plus (with caffeine). Any remaining gels taken in that hour should be standard EnergyGel (no caffeine).

recovery after:

To re hydrate and refuel, to help develop lean muscle faster and improve fitness gains: drink 750ml of EnergySource 4:1 when you finish. Drink another 500ml one hour later. Eat a balanced meal. In the late evening drink 750ml or more of Protein Recovery. When mixed with milk, Protein Recovery is absorbed more slowly and provides a long lasting feed while you sleep.

notes: Substitute IsoGel for EnergyGel if you wish and use a Gel Flask for one-handed operation.

Do not eat or drink anything else during your Time Trial, you will not need it.

Carbo-loading before an event can increase the amount of carbohydrate you have stored by 30%. See back of guide.

If you are an elite competitor racing at high heart rate, your ability to absorb carbohydrate will be reduced. You may need to reduce the amount of carbohydrate suggested in these guidelines, particularly over a shorter 50 mile event.

60 to 200 mile cyclo sportive

60 to 90 minutes before - caffeine load:

Drink one 750ml bottle of EnergySource X'treme in the period 60 to 90 minutes before your race starts. At the same time take the following number of EnergyGel Plus sachets based on your body weight:

50kg to 60kg: 1 x EnergyGel Plus
60kg to 70kg: 2 x EnergyGel Plus
70kg to 90kg: 3 x EnergyGel Plus

during your event:

Focus on drinking as much as possible. Your body is able to absorb more than 90g per hour of the 2:1 fructose mix found in EnergySource.

Depending on how much you are able to drink, you may need to take gel to further boost your carbohydrate intake. If you drink the following amounts of EnergySource each hour, you should also take the number of gels shown:

800ml to 1200ml	no gel
600ml:	1 x EnergyGel Plus
400ml:	2 x Gels
200ml:	3 x Gel

The first gel each hour should be EnergyGel Plus (with caffeine). Any remaining gels taken in that hour should be standard EnergyGel (no caffeine.

recovery after:

To re hydrate and refuel, to help develop lean muscle faster and improve fitness gains drink 750ml of EnergySource 4:1 as soon as you finish. Drink another 500ml to 750ml one hour later. Eat a balanced meal. In the late evening drink 750ml or more of Protein Recovery mixed with milk.

notes: Read the notes for 50 to 100mile Time Trial - they also apply to Sportive. In addition, note the following points:

If you drink 1000ml per hour (hot conditions) and are therefore not taking gel containing caffeine, you should aim to consume one 500ml bottle of X'treme (high caffeine drink) at some point around 3-hours into your event. This will keep your caffeine levels in the performance enhancing zone. Simply substitute 500ml of X'treme for your normal drink.

If your event is longer than 5-hours, consider substituting EnergySource 4:1 instead of standard EnergySource. See web site for details of why this may offer additional performance benefits.

stage racing

try in training before you race

60 to 90 minutes before - caffeine load:

Drink one 750ml bottle of EnergySource X'treme in the period 60 to 90 minutes before your race starts. At the same time take the following number of EnergyGel Plus sachets based on body weight:

50kg to 60kg: 1 x EnergyGel Plus
60kg to 70kg: 2 x EnergyGel Plus
70kg to 90kg: 3 x EnergyGel Plus

10 minutes before the start:

Drink 200ml to 500ml EnergySource. This counts towards the drink you have consumed in the first hour.

during your race:

Focus on drinking as much as possible. Your body is able to absorb more than 90g per hour of the 2:1 fructose mix found in EnergySource.

Depending on how much you are able to drink, you may need to take gel to further boost your carbohydrate intake. If you drink the following amounts of EnergySource each hour, you should also take the number of gels shown:

1000-1200ml: no gel
800ml: 1 x EnergyGel Plus
600ml: 2 x Gels
300ml or less: 3 x Gels

The first gel each hour should be EnergyGel Plus (with caffeine). Any remaining gels taken in that hour should be standard EnergyGel (no caffeine).

When racing at high heart rate: typical of the latter stages of your race, your body's ability to absorb carbohydrate will be reduced. If you drink the following amounts each hour, then take the gels shown below:

600ml or more: no gel
400ml take 1 x EnergyGel Plus
200ml take 2 x EnergyGel Plus

recovery after:

To rehydrate & refuel, to help prevent the loss of lean muscle and to improve fitness gains, drink 750ml of EnergySource 4:1 as soon as you finish. Drink another 500ml to 750ml one hour later. Eat a balanced meal. In the late evening drink 750ml or more of Protein Recovery mixed with milk. When mixed with milk, Protein Recovery is absorbed more slowly and provides a long lasting feed as you sleep.

when racing twice a day:

Follow the previous guidelines for your first race distance. Between races drink as much EnergySource 4:1 as you can. This will help you re-fuel and re hydrate. To keep your caffeine level in the performance enhancing zone, take one sachet of EnergyGel Plus each hour.

continued...

For your second race of the day, follow the guidelines for that race distance, but do NOT caffeine load 60 to 90 mins before, as you will already be loaded.

racing long or multi day events in very hot conditions:

High5 drinks contain a relatively high level of key electrolytes and for most conditions they are more than adequate. However, for longer distance or multi day racing in more extreme heat, you may want to increase the electrolyte content of your drinks. You can do this using High5 ZERO SALTS - see later in this guide for more information.

notes: You can substitute IsoGel for EnergyGel if you wish.

These guidelines should provide your body with the maximum amount of carbohydrate it can absorb. Do not eat or drink anything else, as you will not need it.

Carbo-loading before an event can increase the amount of carbohydrate you have stored by more than 30%. See next page for more details.

If you drink 1000ml per hour (hot conditions) and are therefore not taking gel containing caffeine, you should aim to consume one 500ml bottle of X'treme (high caffeine drink) at some point around 3-hours into your event. This will keep your caffeine levels in the performance enhancing zone.

carbo-loading

Carbo-loading is normally undertaken prior to a major event. It's a technique that can increase your body's carbohydrate stores by 30% or more. Here is an effective and easy method that does not require long periods of non training or a radical change to your diet.

days 3-2-1 before your race: each morning drink 750ml of EnergySource. Wait for 30 minutes, then jump onto your bike and warm up easy for 10 minutes. Follow that warm up with a single 3 minute sprint. You should aim for a good lactic acid build-up during the sprint, which will encourage your body to store carbohydrate.

You should then aim to consume 10 gram of carbohydrate per kg body weight during the day. For a 70kg rider that would be 700 gram of carbohydrate per day.

Athletes often find it difficult to consume that amount of carbohydrate using normal food.To avoid the bulk of high-carb foods: every three hours drink 500ml of EnergySource and eat one energy bar. After 12 hours this will provide you with around 360 gram of carbohydrate. Your normal high carbohydrate diet should provide the rest.

4:1 and training

You become fitter and faster as your body changes (adapts) in response to training. For every few hundred miles of riding, you would normally expect to see an increase in muscle quality and fitness. But what if you could build lean muscle faster and get fitter quicker with the same amount of training?

EnergySource 4:1 is better for hard training and racing over multiple days: Sports scientists from the University of Glasgow in 2008 showed that during the gruelling 8-days of the Trans Alp MTB race, riders using a protein / carb drink (EnergySource 4:1) raced an average ~ 10% faster compared to a carb only drink [7].

Protein / carb shown to be better for muscle development: Researchers from Maastricht University in 2007 showed that compared to a carbohydrate only drink, consuming a protein / carb drink lowered the rate of protein breakdown during hard exercise by 26% and raised protein synthesis (muscle rebuilding) by 33%.

Protein / carb superior for two sessions in one day:

In a 2008 study: when cyclists rode flat-out for one hour and then after a pause of 6 hours they rode again for one hour as fast as possible, they were significantly faster in the second ride after consuming protein/carb as compared to consuming carbohydrate only.

[7]Trans Alp study: Cathcart et al., Med Sci Sports Exerc; 40 (5) Supplement 1:S74, 2008. J Int Soc Sports Nutr, January 1, 2008.

When you find it hard to get motivated: to prepare for a tough session, take X'treme stimulant drink 30 minutes before you start. Take a couple of sachets of X'treme in your back pocket to get you or a friend back into the group if you fatigue and go off the back.

High5 ZERO is a low calorie fizzy tablet sports drink with electrolytes and magnesium.

High5 ZERO SALTS (neutral flavour) can be added to any drink to make it into a sports drink. It can also be added to High5 sports drinks to increase the electrolyte content if you are racing in very hot conditions.

burn more fat during exercise

High5 GT100 is a new "activated" green tea extract, which is designed to help increase fat oxidation (the amount of fat burned) during exercise. Each tube contains 40 days supply - one capsule per day. Available 2010

Train low race high: This is the concept of training on low carbs / low glycogen in order to improve endurance. Both Zero and GT100 can be used as part of this strategy.

race faster

High5 drinks with 2:1 fructose are advanced nutrition for anyone that wants to ride faster and stronger. The special carbohydrate mix can provide up to 50% more energy and deliver fluids faster than traditional sport drink formulations.

The protein / carb formulation found in EnergySource 4:1 is superior for longer endurance races, hard training and to help maximize the development of lean muscle.

If you follow the advice in this Race Faster Guide, we are so confident that you will ride substantially faster and stronger over every distance[8].

Race Faster Guides are available for different sports.

[8] Race faster guarantee covers events lasting more than 2 hours and it is limited to 600g / 650g sachet size packs of drinks and gels (the appropriate size for first trial).