triathlon

race faster
nutrition guide

sprint
olympic
70.3
full IronMan
carbo loading
training

HIGH5
ADVANCED SPORTS NUTRITION

HIGH5 advanced drinks contain

2:1 FRUCTOSE

Have you ever thought how fast you might race 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 longer Triathlon event or a Cyclo Sportive. The tests involved 40 or 50 miles of riding (dependent on test subject) 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, V02 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.

[4] Some High5 products contain caffeine. EnergySource X'treme may also contain Citrus Auranthium (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** 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.

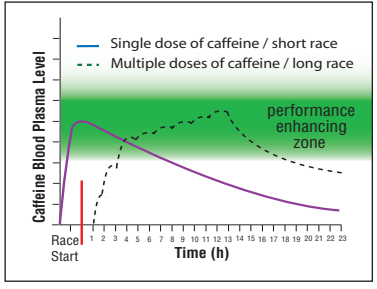


Fig 1. caffeine blood plasma levels over time

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.

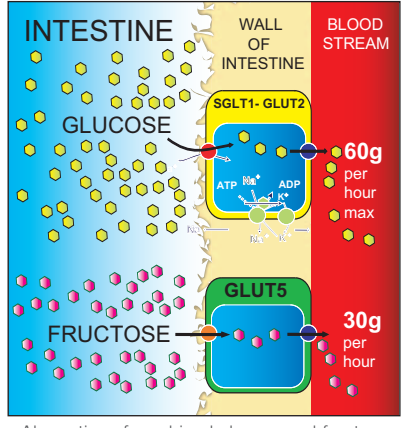
The different types of carbohydrates used in traditional sport drink formulations are first broken down to glucose by your digestive process.

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 does break 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

ride fast

run strong

enjoy your longer races

To race fast and far you need:

- To maximise carbohydrate intake during your race
- To minimize 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. ✓ 2:1 ratio of whey protein isolate (CFM) ✓ slow or fast release
X does not contain caffeine

choose your gel...

EnergyGel & EnergyGel Plus

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 or it would be very sweet. EnergyGel Plus contains 30mg caffeine per sachet

flavours: orange / banana / summer fruits / apple / citrus / raspberry plus / orange plus. ✓ not too thick or sweet ✓ light real juice flavours ✓ plus contains caffeine **X** not 2:1 fructose.

IsoGel & IsoGel Plus

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. IsoGel Plus contains 30mg caffeine per sachet

flavours: orange / berry / citrus (plus) ✓ do not need to drink additional water ✓ not thick or sweet ✓ very light real juice flavours ✓ plus contains caffeine **X** not 2:1 fructose.

accessories you will need

Goodie (Bike) Bag

A goodie bag fits behind the stem and is light, aerodynamic and secure. Holds your nutrition while riding.

High5 Gel Sachet Belt

A High5 gel sachet belt holds 10 or more EnergyGel sachets for longer distance racing.

High5 Race Belt

A High5 race belt holds 3 x EnergyGel sachets for sprint and Olympic distance racing.

Gel Flask

Each gel flask holds 4 EnergyGel sachets and can be used one-handed while remaining in the aero position on the bike.

sprint distance

try in training before you race

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

10 minutes before the swim start

Drink 200ml to 300ml of EnergySource.

during the bike

Drink EnergySource as required to remain hydrated.

during the run

Depending on how long you take to complete your run, you may want to take one EnergyGel or Isogel during the run.

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.

olympic distance

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 swim start:

Drink 200ml to 500ml EnergySource.

during the bike:

During the bike (when its easy to drink), 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 1000ml:	no gel
600ml:	1 x Gel
400ml:	2 x Gels
200ml:	3 x Gels

continued...

during the run:

Take two or 3 EnergyGel or Isogel per hour during the run. Drink water to remain hydrated.

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:

Carbohydrate loading in the days prior to an important race can increase your store of carbohydrate by more than 30%. For anyone that races regularly, the traditional 5 day carbo-loading programmes are not realistic. See later in this guide for a short but effective carbo-loading strategy.

Substitute IsoGel for EnergyGel if you wish.

Use a High5 gel flask for one handed dispensing of gel when on the bike. Use a Gel Sachet Belt or Race Belt to carry your gel while running.

If you are racing in hot conditions (Australia, or Southern Europe), then you should aim to drink a minimum of 1000ml while on the bike.

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.

Do not eat or drink anything else you will not need it. This strategy will provide your body with the maximum amount of carbohydrate it can absorb.

There are alternate High5 strategies that can achieve the same result.

70.3 and IronMan

try in training before you race

These guidelines can provide your working muscles with 1000 gram [4,000 kcal] of carbohydrate during an 11 hour IronMan. Compare that to the 400 gram you typically have stored in your body at the start exercise.

This nutrition strategy will also help you remain well hydrated and provide a measured dose of caffeine.

Carbo-loading:

Carbohydrate loading in the days prior to your race can increase your store of carbohydrate by more than 30%. See discussion later in this guide.

Breakfast on race day:

You should aim to consume around 150 gram of carbohydrate for breakfast. If you want to drink 500ml of High5 EnergySource and eat a EnergyBar, then these will supply you with 90 gram of carbohydrate with little bulk.

15 minutes before the swim start:

Drink 300ml to 500ml of EnergySource and take 1 x gel Plus sachet (with caffeine).

During the ride:

A 70.3 and IronMan is won or lost in terms of nutrition during your ride. You must maximise your carbohydrate intake while on the bike. To remain hydrated in hot conditions, you should try to drink 1000 ml or more per hour.

Depending on weather conditions and 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 to 1200ml:	no gel
750ml:	1 x gel Plus
500ml:	1 x gel Plus and 1 x standard gel
300ml or less:	1 x gel Plus and 2 x standard gel

One gel each hour sould be gel Plus (with caffeine). Any remaining gels taken in that hour should be standard gel.

Caffeine loading during the bike:

In a 70.3 event, you should caffeine load at the start of your ride. In a full IronMan

you can choose a time that best suits you. As caffeine loading will give you both a physical and psychological boost, you may want to wait until later in your ride or in preperation for the run transition. To caffeine load, simply substitute X'treme for your normal drink.

Bodyweight 60kg and under:	750ml X'treme
Bodyweight 60kg and over:	1000ml X'treme

If you are less than 80kg do not use X'treme again during you race. If you weigh more than 80kg then you can drink another 500ml of X'treme at some point during your ride/run.

during the run:

Take 3 x EnergyGel or IsoGel per hour during the run. One of those gels should be the Plus version (with caffeine), while any remaining gel should be standard gel with no caffeine.

continued...

Drink water to remain hydrated.

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.

racing in very hot conditions:

High5 drinks contain a high level of key electrolytes and for most races are adequate. However, when racing full IronMan in very hot conditions, you

should consider increasing the electrolyte content of your drinks. You can do this by adding High5 ZERO SALTS to your energy drink. This is a neutral tasting fizzy electrolyte tablet with an anti-cramp magnesium formulation.

High5 gel (like most brands) does not contain a high level of electrolytes. During the run section of a full IronMan in the heat, you should consider taking salt tablets.

cramp:

Some of the main factors causing cramp are: carbohydrate depletion, dehydration, electrolyte imbalance and insufficient magnesium. These guidelines / nutrition strategy will help against many of these causes. See High5 web site for more details.

Full IronMan - how to carry extra drink:

Fit an aero-bottle and two normal bottle cages to your bike. Fill your aero-bottle and one 750ml drink bottle with ready-to-drink EnergySource. Your second 750ml bottle should contain a concentrated “syrup” of EnergySource.

To make the syrup, pour 500 gram of EnergySource powder into a transparent 750ml bottle and half fill with warm water. Shake for 2 minutes, top-up with more water and shake. Leave overnight and by morning the syrup will be smooth.

You will have made enough syrup to produce 5 liters of ready-to-drink EnergySource. With a permanent marker, make nine big lines 2.2cm apart on the side of your 750ml bottle. At the bike feed station, collect 500ml of water and pour this into your aero-bottle. Then add one measure (2.2cm) of syrup to produce 550ml of ready-to-drink EnergySource. The syrup will mix easily into the water, but before using gently blow down the drinking tube of your aero-bottle. The bubbles will ensure that your drink is well mixed. This whole mixing operation can be completed one-handed.

Repeat the above using X’treme for caffeine loading on the bike, but mix a smaller amount of X’treme syrup into a gel size flask.

Note:

In these guidelines you can substitute IsoGel for EnergyGel if you wish.

continued...

Use a Gel Flask for one-handed dispensing of gel on the bike. Use a Goodie (Bike) Bag to keep your nutrition safe and secure. Use a Gel Sachet Belt to carry your gel when running.

These guidelines should provide your body with the maximum amount of carbohydrate it can absorb. If you feel you must eat solid food to settle your stomach then try to keep this to a minimum, as normal food will slow the abosrption of the special High5 carbohydrate.

If you are competing in an IronMan distance event, you may get additional benefit from using EnergySource 4:1 instead of EnergySource. However, 4:1 is more difficult to mix as a syrup and it does not dissolve as well in an aero bottle when you are out on course. NB: mix 4:1 with warm and not hot water otherwise it will go lumpy.

In warm / hot conditions, it's almost impossible to drink enough to replace what you lose through sweat. If you dehydrate by as little as two percent of your body weight, your performance can drop by up to 8%. Two percent dehydration is the equivalent of a 75kg triathlete drinking just two 750ml bottles less than they need over the entire duration of a IronMan. You must always try to drink as much as you possibly can, especially on the bike.

There are alternate strategies that can achieve the same performance gains.

carbo-loading

Carbo-loading is a technique that can increase your carbohydrate stores by 30% or more. Here is an effective and easy to use method that does not require long periods of non training or a radical change to your diet.

IronMan Distance: day 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 hard 3 minute sprint. You should aim for a good lactic acid build-up during the sprint, which will encourage your body to store additional carbohydrate. Avoid exercising any more that day. You should try to consume 10 gram of carbohydrate per kg body weight each 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.

Olympic Distance: follow the program above for day 2 and day 1 before a major race.

4:1 and training

You become fitter and faster as your body changes (adapts) in response to training. For every 100 hours of training, you would normally expect to see a step 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.

burn more fat during exercise

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.

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 race 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 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 race substantially faster and stronger over every distance

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).