

**SFuels.**<sup>®</sup> ENDURE IQ

SUMMER 2022

# OPTIMIZATION GUIDE

**Live**

Better



**Train**

Smarter



**Race**

Faster



# How to use this Guide

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**Hear Professional Athletes Point of View**

**Learn the basic benefits of Metabolic Flexibility**

## **Section 2 : Everyday Fat-Ox. Pages 7-15**

**Learn how to Accelerate your Transition**

**What's the basic makeup of the Transition Diet**

**Simplify everyday Fat Ox with SFuels LIFE products**

## **Section 3 : Fueling Training. Pages 16-18**

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## **Section 4 : Fueling Racing. Pages 19-24**

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# Professional Athletes Podiums and Records...

“Professional and amateur athletes continue to experience the high risks of spiking and crashing blood-sugars during ultra-endurance racing and training.

Extreme blood sugars swings continue to be a key factor in DNF (Did Not Finish) or poor-performance results, from Gut distress, stable-energy and bonking (hitting the wall).

Without optimally training the body to perform efficient fat-oxidation, athletes have no option but to begin taking in high amounts of sugar-based fuels and drinks, and are then left to experience the devastating effects.

Furthermore, these risks are not limited to racing alone. For years science has shown that the acute and chronic inflammation caused by swinging blood sugars is a leading cause of our most debilitating diseases.”

**Dr. Dan Plews**

Ironman 2018 AG World Champion &  
World Record Holder

Dr. Performance Physiology.

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“As challenging as the year was for professional athletes, my start with SFuels was a highlight with an awesome run of career performances in 2021. Training on a lower carb protocol for my aerobic training, and then higher level of carbs for high-intensity training and racing - has supported me well. My bronze medal at Tokyo Olympics, placing 2nd in the superleague series and then finishing with a win at this years xTerra world championship in Maui. I’m looking forward to 2022 in further optimizing my flexible metabolism of both fat and carboydrate energy stores, with SFuels.”

## Hayden Wilde

Olympic Medalist 2021  
SuperLeague Triathlon Series 2nd 2021  
xTerra World Champion 2021

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“For long endurance efforts, regardless of your dietary preferences, the goal on race day from a fueling standpoint is to defend your small fuel tank, muscle glycogen. Historically, we have been taught that this meant leaning heavily on carbohydrates in daily nutrition, as well as during workout sessions and races. This has left a wake of digestive issues for many professional and recreational athletes who simply have not been able to tolerate that level of intra-race fuel loading. The alternative is to assist the defense of muscle glycogen by improving your fat oxidation rates, which can be done strategically with diet and a more balanced workout fueling strategy. When I started a low carbohydrate approach to endurance over 10 years ago, very few resources were available to replace the carbohydrate rich tools designed for moderate and high carbohydrate athletes. SFuels has created a unique line of products from inter-workout to lifestyle options to help athletes who prefer to lean on fat as their primary fuel source, and defend their glycogen stores in a way that is kinder to their digestion.”

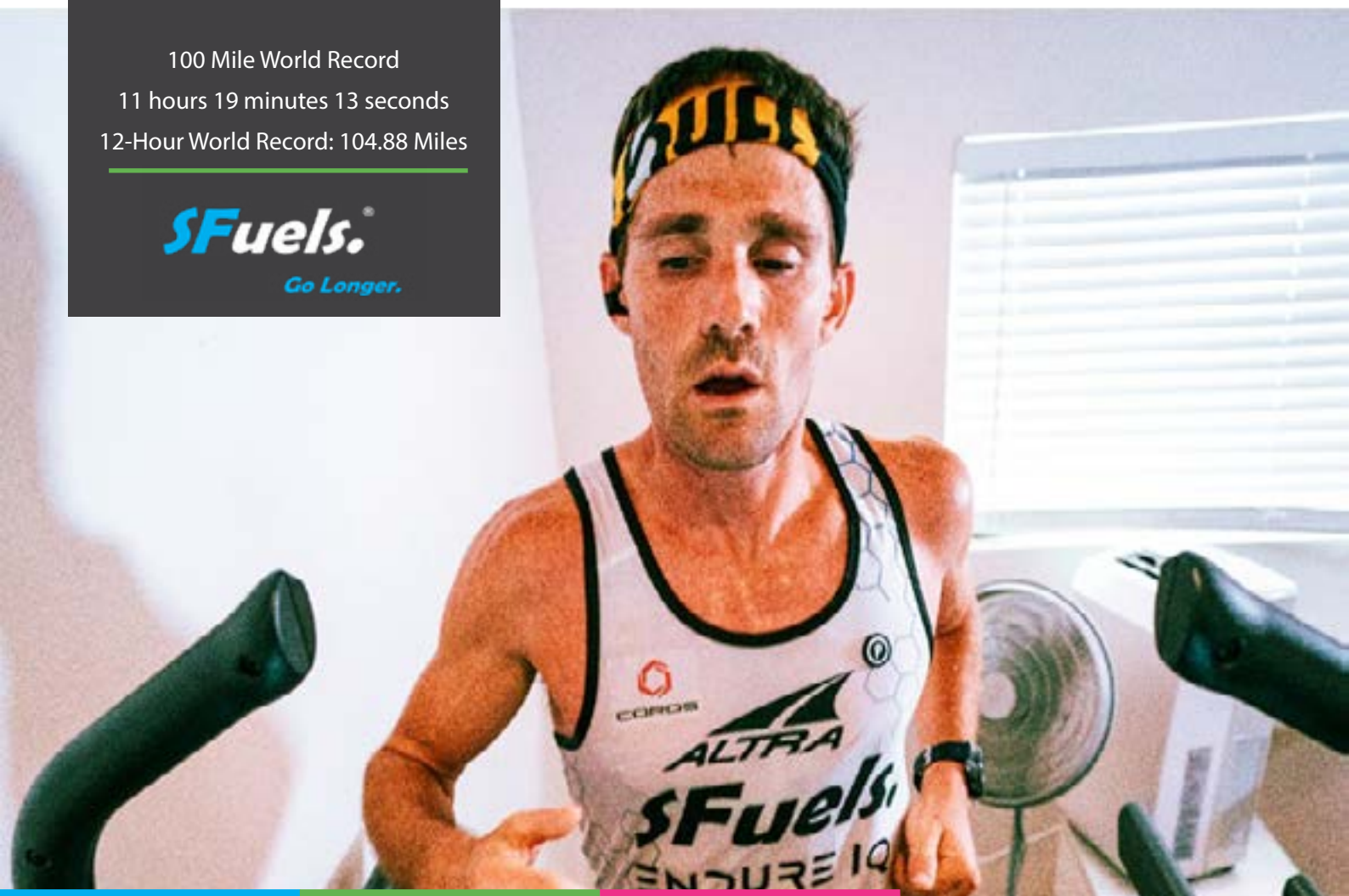
## Zach Bitter

100 Mile World Record

11 hours 19 minutes 13 seconds

12-Hour World Record: 104.88 Miles

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“Since 16 years of age, I’ve been racing on the Xterra World Tour and won my first professional World Tour title at age 20.

There’s no doubt that this ability to perform on the world stage at a young age was due to the increased training load, faster recovery and more consistent power as a result of being a fat adapted athlete. Especially in such high intensity racing the margin between winning and losing is tiny, so there’s no way I wanted to run the risk of spiking blood sugars, bonking and race ending GI distress. Plus even as a young athlete longevity is always in the forefront of my mind, which is why I’m particularly excited to build a lifelong career alongside a company like SFuels who I know for certain put the level of attention to detail into their products as I do into my race performances.”

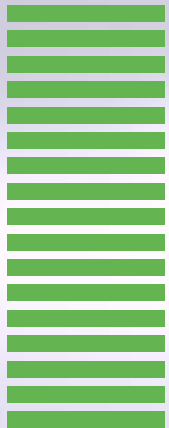
## Lewis Ryan

Professional Athlete  
ITU Cross-Tri World Champion  
Xterra World Tour Race Winner

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~40,000  
kcal.



Fat

~2000  
kcal.

Glycogen

# The Benefits of Going Longer.

While the body holds only ~2000 calories of glycogen, 40,000 calories of fat are ready and waiting to be used for fuel. However, most endurance athletes have trained themselves to first, burn sugars for fuel, while-leaving these fat reserves under-utilized.

What if we could shift our fat oxidation from 0.3 Grams/Hour, to over 1.2Grams per hour? Wouldn't you want to Go Longer, with –



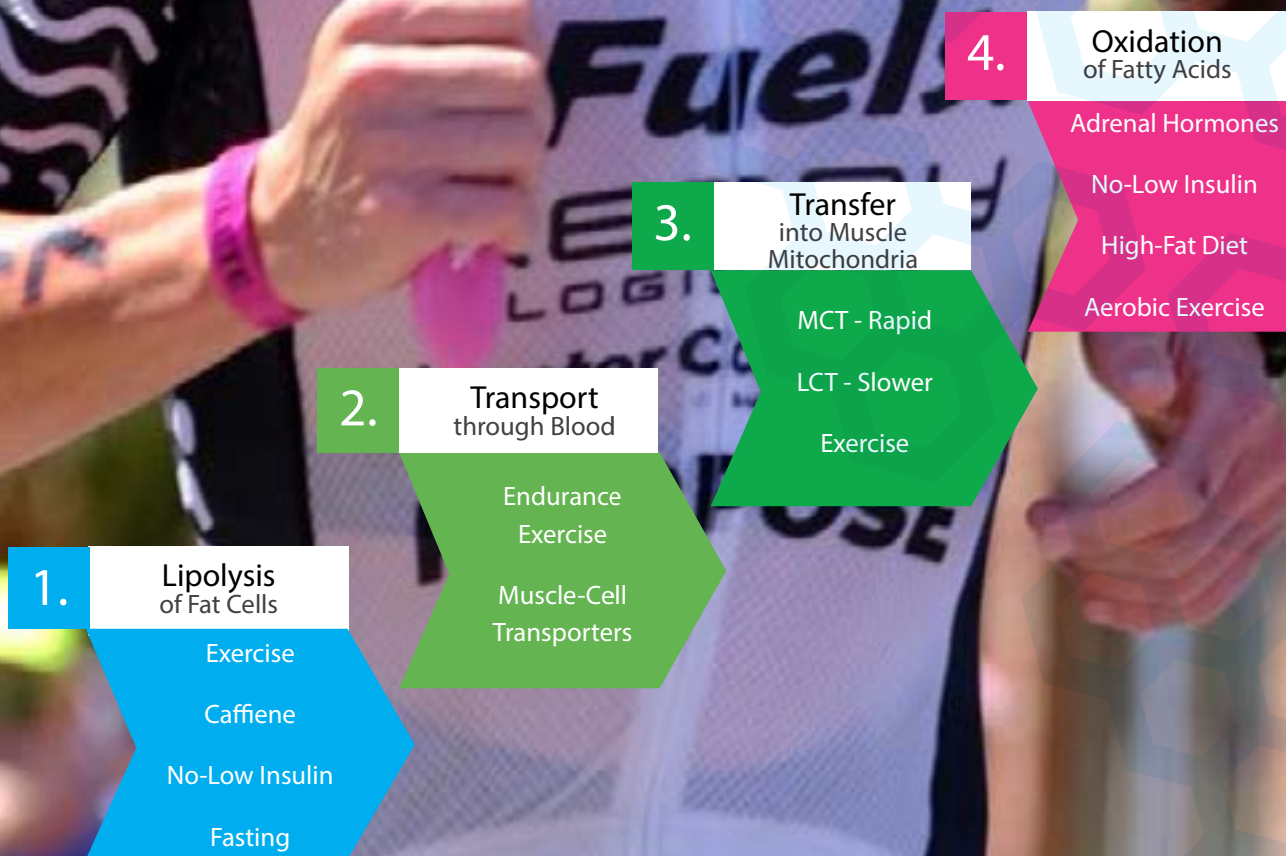
[CLICK HERE](#)

- An improved smoother stream of energy, and preserved glycogen levels,
- A lower requirement to carry and consume high-amounts of carbs,
- Reduced risk of sugar-crash bonks in high-intensity training and racing,
- Reduced sugar-triggered GI/gut distress in training/racing, and,
- Improved recovery and more consistent training blocks.



# THE 4 STEPS AND DRIVERS OF EFFICIENT FAT OXIDATION

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In a simplified view, there are 4 key physiologic steps which lead to the oxidation of fat in the muscle cell. Each of these steps have multiple factors which can ramp up, slow-down or shut-down this metabolic chain. Clearly exercise positively effects many of these steps, while conversely insulin (triggered by simplified carbohydrates) blunts several of these steps. Like all physiologic processes in the human body, this physiology can be trained and improved for greater efficiency.



# START HERE

To ACCELERATE your metabolic transition we'll need to shift from a high-carb intake to a temporary low intake

# ACCELERATE YOUR TRANSITION

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## LIVE LOWER

Maintain a lower-carb higher fat lifestyle in the 50-150Gr/ Carb per day range, to begin building the foundation of a fat-adapted metabolism.

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## USE BOTH CARBS & FAT

Simultaneously access multiple energy-substrate sources including medium/ long chain fats and carbohydrates for high-intensity training and racing.

## TRAIN FAT-OXIDATION

Optimally train metabolic systems to efficiently burn fat during longer slow low-intensity training, through fueling with minimal carbs and higher fat.

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## 2-4 WEEK TRANSITION

Make a temporary shift to ~50Gr/ Carbs per day for 2-4 weeks, while raising fat consumption to rapidly up-regulate fat oxidation enzymes and metabolic efficiency.

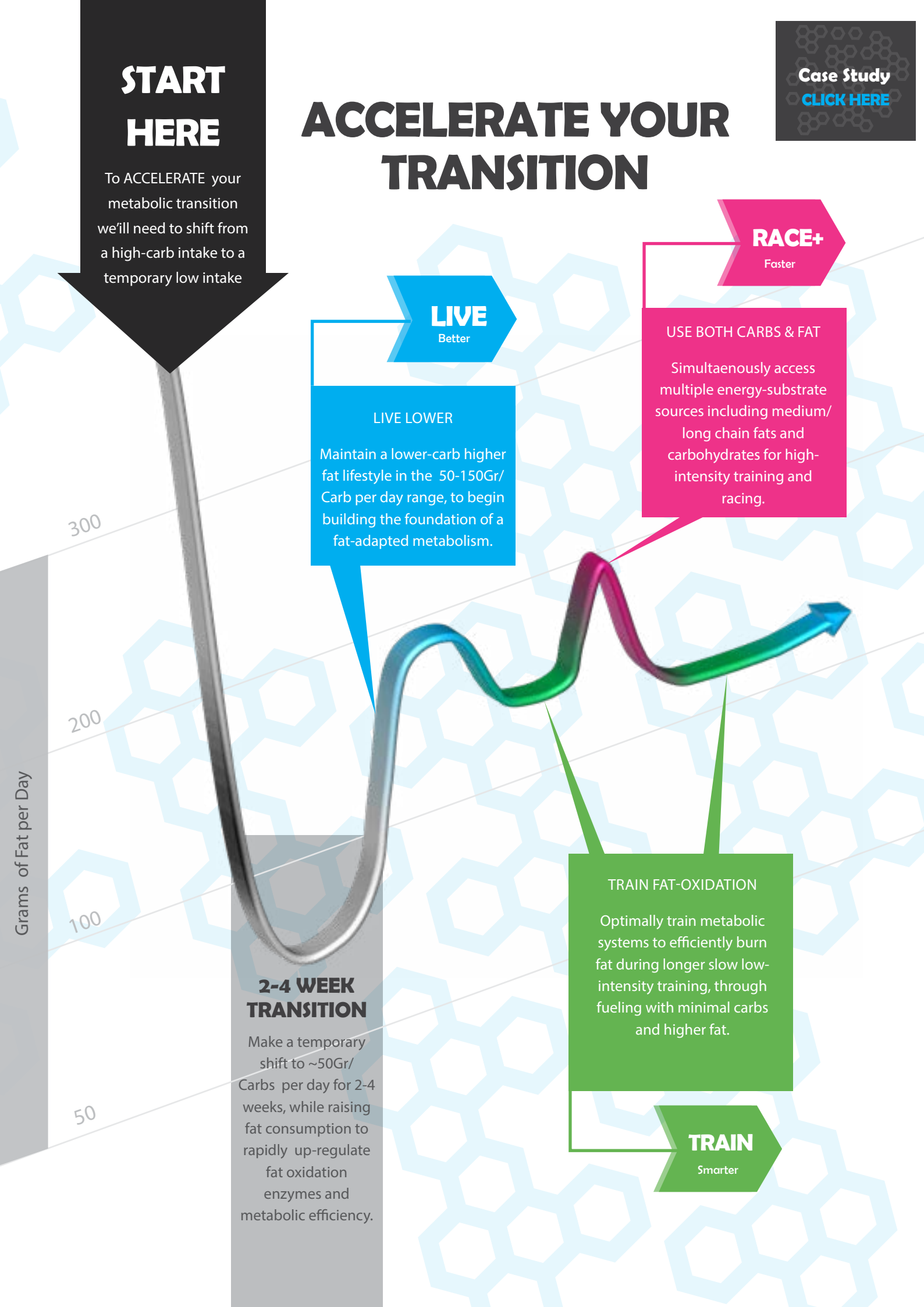
Grams of Fat per Day

300

200

100

50



# 2-4 WEEK TRANSITION DIET

Facilitate the re-training of your fat-oxidation enzymes and physiology by making a temporary shift in your choice and mix of macro food types (Carbs-Fats-Protein) for a 2-4 week period.

**CARBS**  
REDUCE TO

**~50Gr**  
per day

**FATS**  
INCREASE TO

**65-80%**  
of your daily Calories

**PROTEIN**  
TIMED/MEASURED

**1.0 – 2.0**  
Gr/Day per pound per athlete  
recommendations<sup>1</sup>

## YES

Non-Starchy Vegetables  
All Berries  
  
(see Page 15)

Creams, Butter, Nuts  
Olive, Coconut Oil, Whole  
Fat Yoghurt, Avocado,  
SFuels Train

Fish, Eggs, Meat, Chicken,  
Beans, Nuts, SFuels Revival,  
SFuels LIFE Bars

**KEEP IT SIMPLE - by using SFuels LIFE Products, highlighted on the next 4 pages.**  
SFuels TRANSFORM SFuels Keto3 Cereal SFuels PRIMED Drinks SFuels Life Bars

## NO

Pastas, Rice, Grains  
Cereals, Sodas, Juices,  
Baking, sugar, candy

Safflower, soybean, corn,  
peanut, canola oils

Fat reduced Dairy snacking  
between meals.



**Easily create meals, by choosing from 100s  
of these Low-Carb High-Fat recipes.**

<https://www.pinterest.com/sfuelsgolonger/>



Have a Question? Need help or support?

Email SFuels Support Team: [Support@SFuelsGoLonger.com](mailto:Support@SFuelsGoLonger.com)



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# SFUELS TRANSFORM

Use SFuels TRANSFORM to SIMPLY RESHAPE your everyday snacks, shakes and meals to a lower-carb, higher fat profile. Make it easy to keep the same snacks and meals you like - but without the sugar and insulin spikes.

## ELECTROLYTES (SALTS)

Maintaining normal electrolyte levels helps to regulate mental and physical drive, as you transition off high-carb foods & simple sugars in the diet.

## QUALITY CALORIES

Maintain caloric intake with medium chain-triglycerides and higher fat snacks, foods and drinks, while training your fat-oxidation. Eliminate the need to use sucrose, fructose, glucose, maltodextrins and sugar alcohols in your foods and meals.

## NATURAL SWEETNESS

Avoiding artificial sweeteners, and sugar alcohols, SFuels TRANSFORM is mildly sweetened using Monk Fruit.



**DOWNLOAD THE  
SFUELS LIFE  
RECIPE GUIDE HERE**

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# SFUELS KETO3 CEREAL

Healthy full fat satisfying breakfast, as a muesli, granola or hot oatmeal style.

A deliciously satisfying vanilla-cinnamon blend, KETO3 contains more protein than an egg, more energy than a bowl of oats, while less sugar than 3 grapes.

Super low-carb, grain free, gluten free, sugar-alcohol free, Keto3 is a clean cereal, that isn't baked, flaked, puffed or fried.

## BREAKFAST REIMAGINED.

High-Energy Start, without all the sugar.



1 <https://fdc.nal.usda.gov/fdc-app.html#/food-details/173424/nutrients>

2 <https://fdc.nal.usda.gov/fdc-app.html#/food-details/168203/nutrients>

3 <https://fdc.nal.usda.gov/fdc-app.html#/food-details/734348/nutrients>

4 <https://fdc.nal.usda.gov/fdc-app.html#/food-details/174683/nutrients>



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## SFUELS PRIMED.

SFuels PRIMED Caffeinated drink mix powders, with taurine, B-vitamins - but without the added sugar. PRIME your work-day, your training session, or your racing fuel.

Unlike random caffeine levels from coffee, tea and high sugar soft drinks, SFuels PRIMED, provides a measured dose of caffeine from Green Tea extract, without the sugar. Supporting improved mental focus, raised fat oxidation, PRIME your MOJO while avoiding the high sugar peaks and crashes.

With a measured dose of 80mg caffeine, with taurine and b-vitamins, SFuels PRIMED, primes your heart, mind and muscle to support you getting the job done best. In a super compact convenient, sachet format, professionals and athletes alike can take a personalized and trusted approach to PRIMING their workday, training, race or competition.

# GO PRIME YOUR MOJO.





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# SFUELS LIFE BARS

Grab and Go great tasting real food, mixed with resistant starches, fat and protein to satisfy an endurance athletes intense appetite, while supporting muscles and gut recovery.

Train the body to use fats for fuel by eliminating the use of sucrose, fructose, glucose, maltodextrins and sugar alcohols. Provide quality oils and fats to help train the bodies metabolism for efficient fat-based calorie absorption, assimilation and utilization.

Provide highest quality protein isolate for excellent absorption, and minimized lactose levels to support repair of micro-muscle damage and minimize the unwanted effects of higher milk-sugar loads or lactose-sensitivities.

## INCREASE YOUR HIGH-INTENSITY THRESHOLD WORKOUTS

1



Hit your high-intensity workouts with force, feeling satisfied and fueled, without the sugar spike. Take SFuels LIFE BARS ~1Hr before your workout.

**HIT Training  
When Carbs?**  
[CLICK HERE](#)

## OPTIMIZE YOUR RECOVERY, POST AEROBIC WORKOUTS

2



Support recovery of micro-fibre muscle and gut-membrane damage from long endurance workouts, by feeding quality protein isolate and resistant starches, without the sugar spike or sugar alcohols. Take SFuels LIFE BARS within 30mins after your workout.

## OPTIMIZE YOUR FAT OX' EFFICIENCY - INTERMITTENT FAST

3



Continue to max your fat-oxidation efficiency from overnight intermittent fasts, by breaking the fast with a very low- carb, high fat-protein-fibre snack. After a 14-15 hour overnight fast, break your fast with SFuels LIFE BARS and/or water, coffee or tea.



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# BEST CARBS TO USE

Low-carb does not mean 'no-carb'. Here's a spread of nutrient dense low-carb, low glycemic index foods - you can add as much as you like into your diet and lifestyle.



## Cooking: Fiber and blood sugar impact.

Natural fruits and vegetables are not only dense in nutrients, but also in fiber. Fiber slows the digestion-absorption rate of nutrients into the blood system. Cooking dilutes this impact, by breaking down the cellulose in fiber, so seek to maintain a mix of uncooked and cooked carbs.

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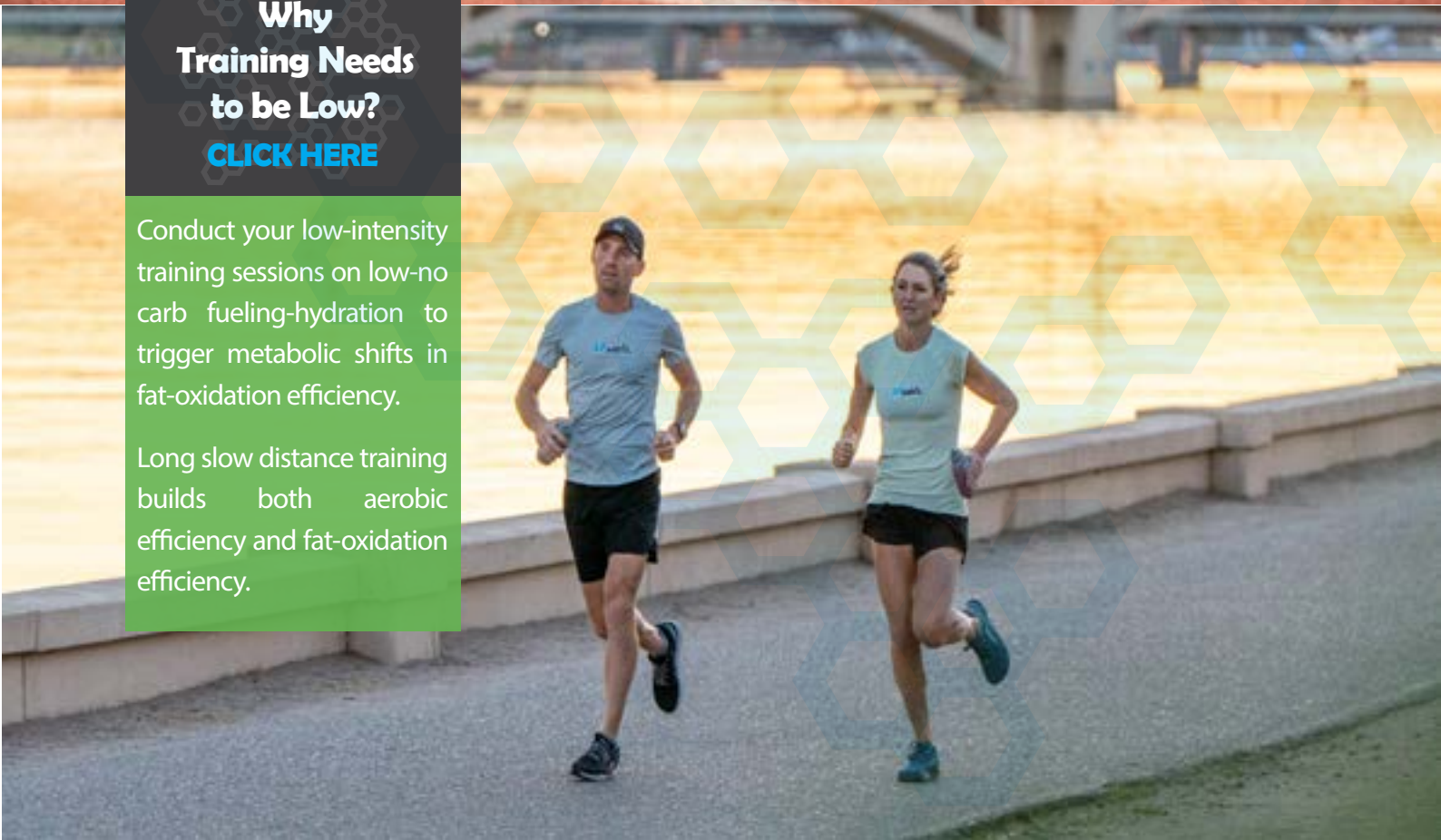
# LOW-CARB TRAINING



**Why  
Training Needs  
to be Low?**  
[CLICK HERE](#)

Conduct your low-intensity training sessions on low-no carb fueling-hydration to trigger metabolic shifts in fat-oxidation efficiency.

Long slow distance training builds both aerobic efficiency and fat-oxidation efficiency.





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# TRAINING FAT OXIDATION



## Training Fat Oxidation

Day to day dietary (including during training) intake of quality fats, begins to shift and train the internal metabolism and muscles to become less reliant on carbohydrates. Lipolytic and oxidative enzymes that breakdown fat can be trained (like muscles) through diet and exercise, with athlete lab<sup>1</sup> results showing upto 2X improvement, in fat oxidation efficiency.

An athlete will develop this adaptive fat oxidation response by burning more free fatty acids and/or ketone bodies for fuel at higher and higher intensities. Fat oxidation while training, is highly valuable to the endurance athlete in enabling the body to preserve precious glycogen stores, while enabling stable fuel-energy to muscles through flexible and simultaneous supply of fat and carbohydrate substrates.

As consistently recommended by sports science research<sup>2</sup> and coaches, endurance athletes should conduct the majority (~80% duration) of their training in Zone 2<sup>3</sup> to optimize their aerobic metabolism, while minimizing inflammatory load and triggers. **High-Intensity interval training (and fueling) is critical to optimal performance, and will be covered in the following Racing/HIT section of this guide.**

## Low-Intensity Training Fuel: SFuels TRAIN

At lower intensity training, fat oxidation is the predominate fuel substrate used by exercising muscles. Athletes trained on lower-carb substrates have shown they can spare and preserve glycogen levels longer than high-carb athletes. The below chart provides simple guidance of using SFuels TRAIN for both lower, and higher carb lifestyle athletes. Also highlighted here is the recommended guidance of when to shift (relative to duration) to SFuels RACE+ (mix of fat and starch-carbs) fuel in your training sessions.

### SFuels TRAIN - Servings / Hour

(in 16oz water. Add/Reduce water per serve, relative to your ambient environment)

Athlete Type	Discipline	1Hr	2Hr	3Hr	4Hr	5Hr
Low-Carb (50-150gr/Day) Diet-Lifestyle Athlete	Swimming	Water	1Hr	1/Hr	Shift from SFuels TRAIN to: Race+ 1/Hr	Shift from SFuels TRAIN to: Race+ 1/Hr
	Cycling	1/Hr	1/Hr	1/Hr		
	Road Running	1/Hr	1/Hr	1/Hr		
	Trail/Elevation Running	1/Hr	1/Hr	1/Hr		
Higher-Carb (>150gr/Day) Diet-Lifestyle Athlete	Swimming	Water	1/Hr	Shift from SFuels TRAIN to: Race+ 1/Hr	Shift from SFuels TRAIN to: Race+ 1/Hr	Shift from SFuels TRAIN to: Race+ 1/Hr
	Cycling	1/Hr	1/Hr			
	Road Running	1/Hr	1/Hr			
	Trail/Elevation Running	1/Hr	1/Hr			

1. Endure.IQ athlete laboratory testing. 2019/2020.

2. Endure.IQ LDT102 - Training Program Fundamentals for Long Distance Triathlon. <https://www.endureiq.com/why-ldt102>

3. Zone 2 Training for Endurance Athletes. <https://www.trainingpeaks.com/blog/zone-2-training-for-endurance-athletes/>

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# SFUELS TRAIN

Train the body to efficiently use fat for fuel, by mitigating sugar spikes.

SFuels TRAIN excludes sucrose, fructose, glucose, maltodextrin based carbs and sugar alcohols, and uses Medium Chain Triglyceride (MCT C8) based fats, from Coconut Oil - which has shown to be maximally ketogenic of all the oils/fats.

Provides a water like easy to drink fluid, by avoiding heavy-thick textures of high-starch hydration and fueling formulas.

Support exercise heat induced GI/Gut membrane integrity distress and delayed onset muscle soreness by fueling muscles and gut membrane with clinical levels of L-Glutamine.

Support long duration low intensity muscle contractions with higher-dose supplemental electrolytes, including Sodium, Pottasium and Calcium.

Improve the support of vitamin C levels within cells for immune and anti-inflammatory processes, by keeping blood-sugar levels in healthy ranges.







# RACING AND HIGH-INTENSITY TRAINING

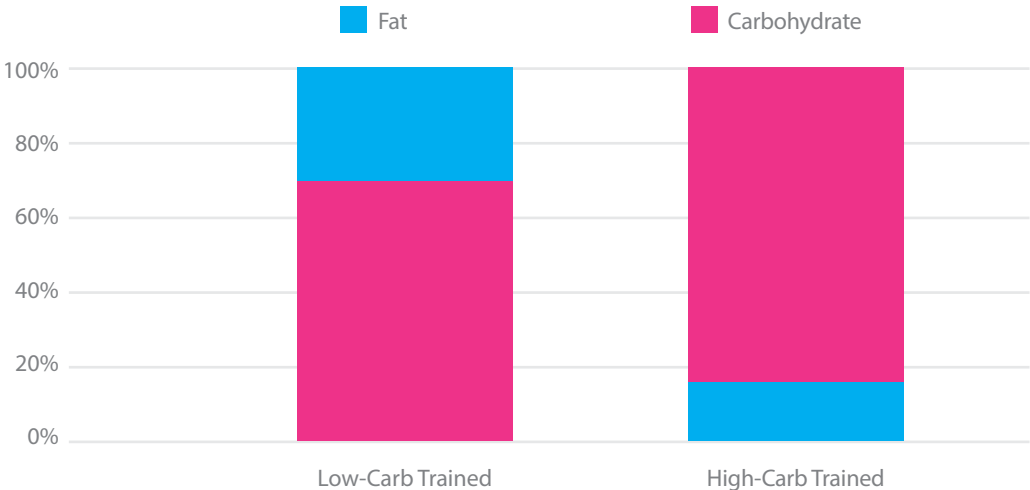
VO2Max substrate testing has shown that Low-Carb trained athletes can oxidize fats at over 90 grams per hour, which can in some cases, be as much as 3-4 times more than high-carb trained athletes.

This approach supports the low carb trained athlete to train or race at higher intensities, consume less carbs, in the interest of avoiding the infamous bonk, race stopping gut distress ([PAPER HERE](#)) and unmanageable energy swings."



## Fat/Carb % Oxidation Efficiency at High Intensity

Comparison at 270W Cycling



How the MATH WORKS? [CLICK HERE](#)

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# RACING, COMPETITION & HIGH-INTENSITY TRAINING

## Pre-Race and Racing: Fat/Carb Optimization

Pre-Race	<b>RULE 1: SFuels TRAIN SFuels PRIMED.</b>
Racing & Competing	<b>RULE 2: SFuels RACE+ SFuels PRIMED.</b>

**RULE 1:** DO NOT consume insulin triggering grains, starch, simple sugars or large amounts of dairy on race morning. Target low-carb cereals, eggs, coffee/tea, low-carb fruits like berries, or SFuels LIFE bar, SFuels TRAIN as best pre-race meal considerations.

**RULE 2:** Complete the first 30-60 minutes of your race with NO intake of sugars/carbs. Use SFuels TRAIN for hydration-electrolyte support in this first 30-60minute race period if desired. Begin using SFuels RACE+ after the first 30-60mins of racing, competition or high-intensity training .

Applying this to your race-day prep enables muscle cell glucose transporters, to rapidly move to the muscle cell wall, open glucose channels, and allow the free flow of glucose into the muscle cells, without insulin. Muscle cells are better positioned for improved simultaneous oxidation of both fats and glucose, thereby providing a smooth supply of energy and power. By enabling higher fat oxidation during high intensity racing, athletes will burn less glycogen (sparing effect) and also reduce the risks of known gut/GI distress from simple sugars like sucrose (fructose+glucose) and fructose.

Train and test your fuel-water dosage requirements against expected race day intensities, temperature, elevation and duration.

\*Rate of Perceived exertion is provided as a guide here to help, translate exertion signs of rising intensity levels to approximate lactate threshold levels – and where oxidation rates shift between fat and carbohydrate.

## PRIMING Focus and Maximum Fat Oxidation

Resarch findings<sup>1/2</sup> are suggesting that a measured dose of caffiene for both improved mental-cognitive focus and heightened maximal fat oxidation during exercise. By adding a measured dose of caffiene ~30-60mins prior, and during your racing/competition, athletes can prime, and continue to prime optimal focus on competing, whilst ensuring maximal fat oxidation continues, in seeking support glycogen sparing as much as possible. See the next few pages on how to dose your SFuels RACE+ and SFuels PRIMED.

**80mg  
CAFFIENE**

[1 Effect of Acute Caffeine Intake on the Fat Oxidation Rate during Exercise: A Systematic Review and Meta-Analysis.](#)

[2 International society of sports nutrition position stand: caffeine and exercise performance](#)



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# RACE+ DOSAGE GUIDANCE

## Dosage Guidance – During Race

As intensity levels shift during the race from changes in elevation, wind, heat/humidity, competitive-racing dynamics, and exhaustion – carbohydrate oxidation will increase, and therefore carbohydrate intakes will need to increase.

However, athletes with high fat-oxidation efficiency will burn more fat, and preserve glycogen stores better, and therefore require less carbohydrate intake than high-carb (less efficient) athletes.

	Fat-Ox Efficiency	Fat-Oxidation Grams/min	Fat-Oxidation Calories/Hr.
Highly Efficient Fat-Oxidation (Low Carb) Athletes	Very High	1.5	810
	High	1.4	756
		1.2 - 1.3	702
Less Efficient (High-Carb) Fat Oxidation Athletes	Low(er)	0.3 - 1.0	162 - 540

## Calories/Hour Demand - at Various Intensities

	Cycling			Running		
	12-13 mph	16-19 mph	>20 mph	5 mph (12min/mile)	7 mph (8.5min/mile)	10 mph (6min/mile)
60kg/132lbs	420	660	900	420	630	900
75kg/165lbs	525	825	1,125	525	788	1125
90kg/198lbs	630	990	1350	630	945	1350

Efficient Fat Oxidation Athletes	use SFuels TRAIN	1 Race+ Drink/ Serve/Hour	2 Race+ Drink/ Serves/Hour	use SFuels TRAIN	1 Race+ Gel Serve/Hour	1-2 Race+ Gel Serve/Hour
Less-Efficient Fat Oxidation Athletes	use SFuels TRAIN	2 Race+ Drink/ Serves/Hour	2-3 Race+ Drink/ Serves/Hour	use SFuels TRAIN	2 Race+ Gel Serves/Hour	2-3 Race+ Gel Serves/Hour

Testing fuel-dosages at various intensities in training is critical to best optimize race performance outcomes, and mitigate under/over hydration and gut-distress issues.

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# SFUELS RACE+ DRINK POWDER



Fuel high-intensity training and racing by simultaneously burning fats and carbs.

Using pre-digested branch chained starches with MCT oils, while avoiding added simple sugars, glucose, fructose, syrups, sugar alcohols and maltodextrins.

Enable rapid transit of calories through upper GI tract while racing, by ONLY using low osmolality carbs (pre-digested branch chain starches) and medium-chain triglycerides.

Avoid slow moving carbs like glucose, and higher risk gut irritants like fructose, and sugar alcohols.

Support lowered risk of exercise induced GI/Gut distress and delayed onset muscle soreness by fueling-feeding muscles and gut membranes with L-Glutamine.

Support dependable neuro-muscular contractions, and efficient gut absorption by supplementing with Sodium, Calcium, Potassium and Gut-friendly Magnesium

As an option, mix in SFuels PRIMED caffeine mix (next page) to one of your bike bottles to support maximal fat oxidation and mental focus through bike.



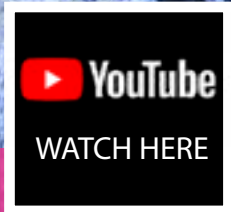
**GO PRIME  
YOUR MOJO.**



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# SFUELS RACE+ GEL POWDER



Extending the utility of race proven SFuels RACE+ drink, athletes can now rely on a concentrated Race+ creme-like gel to power them through the run finish, of their most demanding races.

Using a higher concentrate of cyclic branch-chain starches, plus MCT oils, electrolytes and glutamine, SFuels RACE+ Gel powder compacts down into a highly compact formula, to store-carry through the run leg of your longer half and full-distance triathlons and ultras.

## PREPERATION

Pre-Race (night before) Preparation - add 1.5oz/45ml water, to each 1 serve (37.5Gr/ Scoop) of SFuels Race+ Gel Powder (3oz/90mls when mixed). Mix thoroughly with a fork, until smooth gel creme-like consistency. For higher concentration, use 2 serves to 45-60ml water and mix. Store Race+ Gel in SFuels Race+ Gel Bullets - see below)

**Do not refrigerate** - Keep Race+ Gel concentrate at room temperature, prior to the race.

As an option, mix in SFuels PRIMED caffeine mix (next page) to one of your SFuels Gel Bullets or flasks, to support maximal fat oxidation and mental focus through to the finish line.

**GO PRIME  
YOUR MOJO.**



## Race+ Gel Bullets: Fastest Gel in the West:

Store and quick-access your SFuels Race+ Gel on the run, in your SFuels Gel Bullets, the fastest, cleanest and most environmental sensitive Gel consumption system on the market. Each Gel Bullet can store 140 to 280 calories (1-2 serves) per bullet-bottle. Store upto 4 bullets in back of most race suits - upto 1160 calories).

Access your Gel in seconds, without the mess and without any race course litter or pollution. Leave No Trace at the Race with SFuels RACE+ Gel Bullets .





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# SFUELS PRIMED.

**PRIME: Maximal Fat Oxidation.**

 **YouTube**  
LEARN MORE

Consistent guidance for caffeine to support improved fat oxidation, points to a range of 2.5-3mg caffeine/Kg of body mass.

As general guidance, caffeine reaches its peak in the body within ~60minutes from when its consumed.

For **Pre-race dosing**, take with water and drink as part of your pre-race/competition meal/drinks.

For **in-race dosing**, simply add SFuels PRIMED powder, (prior to the race start) to your SFuels Race+ drink bottle(s), and SFuels Race+ Gel bullets on the run.

Body Mass (Kg)	Target mg/caffeine	Number of SFuels PRIMED Sachets	
		Pre-RACE Start (60mins prior)	DURING RACE (1st 2Hrs of Race)
55	165	1	1
60	180		1
65	195		1
70	210		2
75	225		2
80	240		2
85	255		2
90	270		2
95	285		3
100	300		3
105	315		3
110	330		3
115	345	3	
120	360	4	

**GO  
PRIME  
YOUR  
MOJO.**



**LIVE**

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# WHAT ABOUT RECOVERY?

High volume training, longer, more frequent sessions and intense racing can overwhelm our physical and emotional health. Progressive improvement during these times of high-stress, can be supported through targeted nutrition and quality recovery. But left unchecked here's what can happen -

## ... SPIKES UP

**1 Oxidation**

**2 Inflammatory Mediators**

**3 Muscle-tissue injury**

**4 Cortisol**

**5 Sympathetic Nervous Response**

## ... DROPS DOWN

**Immune Resistance 6**

**Gut Integrity 7**

**Parasympathetic Nervous Response 8**

**Heart Rate Variability 9**

*Seth Johnson*

**LIVE**

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# WHAT SPIKES UP?

1

## OXIDATION

Endurance training/racing raises substances (reactive oxygen species, or free-radicals) which cause lipid peroxidation and cell-wall breakdown. The body has many enzymes to manage free-radicals, but post ultra race levels can reach almost 90% over, pre-race levels. Aside from acute inflammation, free-radicals have been directly related to chronic diseases.

3

## SYMPATHETIC OVERDRIVE

Over-stimulation of the sympathetic branch of the autonomic nervous system, can trigger difficulty sleeping, higher blood pressure, higher cholesterol, nervousness, and constrained blood supply to the digestive system.

4

## CORTISOL

A constant triggering of cortisol from the adrenal glands, can trigger increased weight gain, slowed healing, muscle weakness.

2

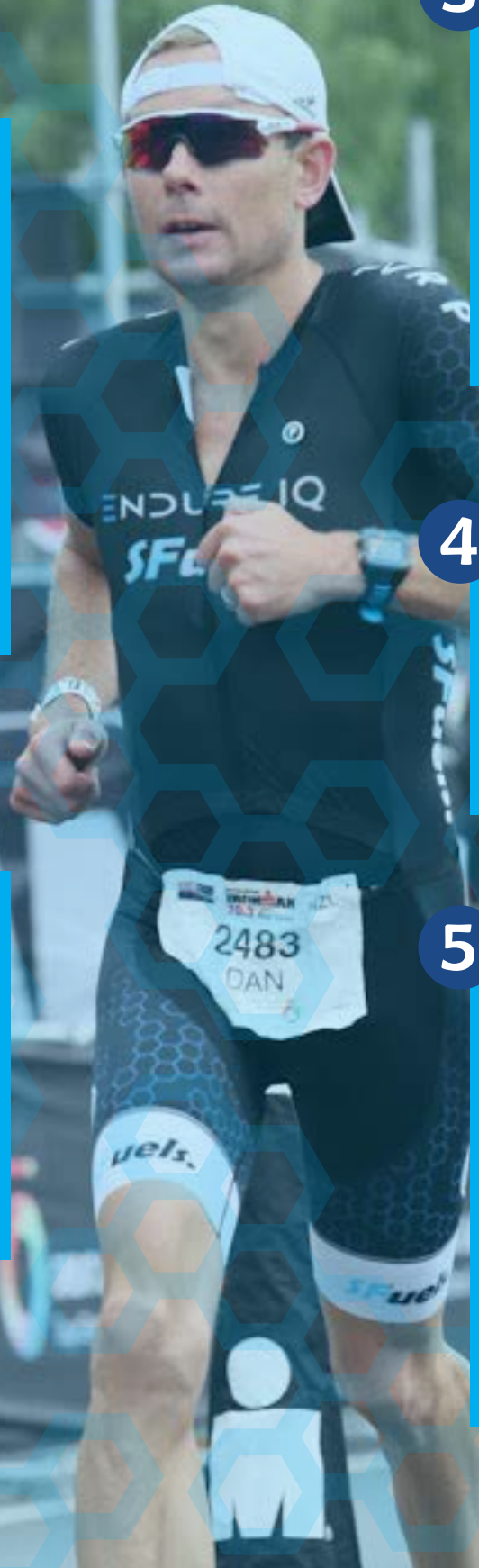
## INFLAMMATION

Endurance training has shown to raise inflammatory markers and powerful cytokines (cell messengers), like IL-6 and TNF. Endurance exercise can more than double the level of these inflammatory markers, versus pre-exercise levels.

5

## MUSCLE BREAKDOWN

Blood tests following endurance exercise, shows heightened levels of Creatine kinase (CK), and myoglobin – both being markers of muscle damage, and post exercise soreness. In fact in ultra-events, markers can remain high for two-five days after race (or training) completion, indicating ongoing muscle damage.





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# WHAT DROPS DOWN?

6

## IMMUNE RESISTANCE

Studies on ultra-marathon finishers, have shown >25% incidence of upper-respiratory tract infections within two weeks post race. Research suggests a decrease in mucosal immunity (IgA) following marathon events. Again, high consumption of sugar (bars, drinks, gels in training/racing) reduces vitamin C transport into white blood cells impairing immunity.

8

## PARASYMPATHETIC TONE

As the sympathetic nervous system dominates over the parasympathetic system, bodily functions like slowing of the heart rate (rest), Gut/GI motility and secretions become weakened and disorderly.

7

## GUT INTEGRITY

Exercise of longer duration, shunts blood from the Gut, creating a hypoxic state (no blood), increasing gut membrane breakdown and the flow of toxic inflammatory compounds into the blood. Heat, simple sugars, dehydration will all increase this.

9

## HEART RATE VARIABILITY

As sympathetic nervous strength prevails, and parasympathetic tone declines, the variability of time between each heart beat decreases – which becomes a key proxy or bio-marker, for athletes looking for early signals of physiologic imbalance, and over-reaching in training and lifestyles.

**THE ULTRA GUT.**

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# SFUELS REVIVAL

Endurance Recovery Drink Supplement

Support the reduction of leucine (protein) muscle oxidation, from high volume endurance exercise by raising levels of B- hydroxybutyrate (BHB) ketones.

Using highest quality whey protein isolate, support lean-body mass, in seeking to reduce the damaging effects of high-volume eccentric muscle contractions (running, cycling etc.) .

Whey protein has also been highlighted for improving immune response, and blunting cortisol responses from training stress.

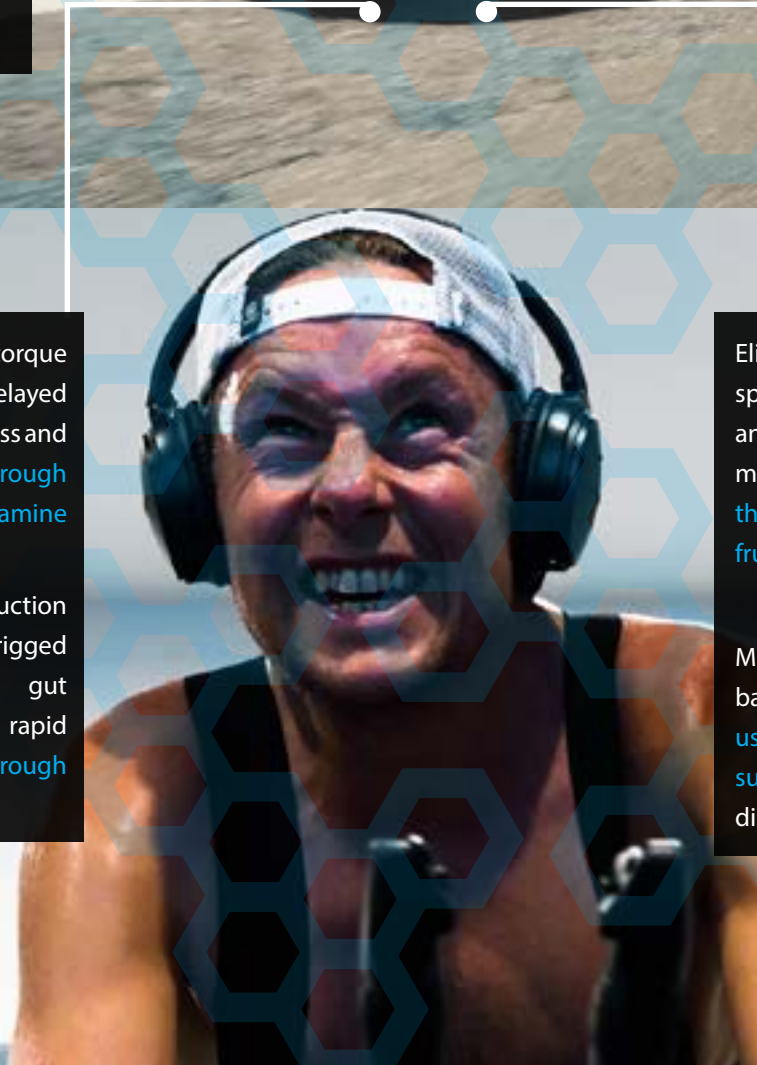
Replenish lowered sodium levels, commonly seen in low-carb endurance athletes.

Support muscle-torque (power), lower delayed onset muscle soreness and inflammation, through high dose L-Glutamine supplementation.

Support the reduction of exercise heat-triggered damage to the gut membrane, by rapid membrane repair, through L-Glutamine.

Eliminating blood sugar spikes, stalled fat-oxidation and heightened inflammatory markers through avoiding the use of sucrose, glucose, fructose, maltodextrins.

Maintain favorable gut bacteria, by avoiding the use of all sugar alcohols like sucralose, that have shown to disrupt the gut microbiome.





LEARN MORE from SFUELS  
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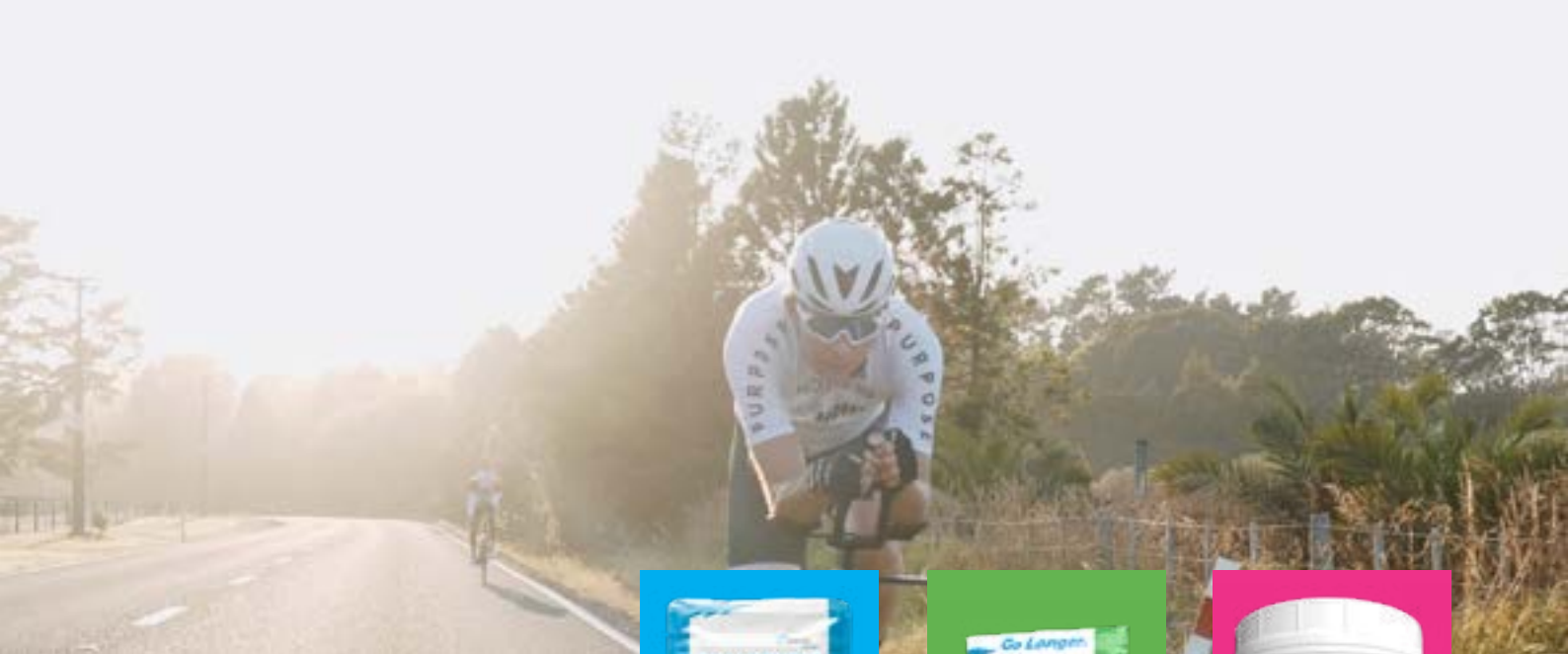
## WORLDS BEST PRACTICE

### ENDURE IQ

Endure IQ breaks down the science of endurance performance into practical information through online education courses and learning communities which will empower you with the understanding needed to find your sweet spot.

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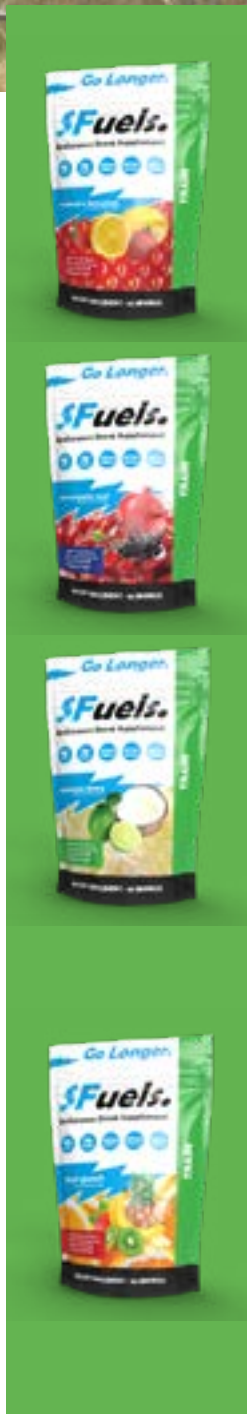
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