EVOLVE

COACHING

NUTRITION & FUELLING GUIDE

The evidence-backed companion to your Evolve plan.
Fuel your riding, absorb your training, get faster.

CONTENTS

Training is the stimulus. Food and recovery are where the adaptation actually happens. This guide is the practical, evidence-backed companion to your Evolve plan and Training Science Guide, so you can fuel your riding, absorb your training and turn hard sessions into real fitness.

SECTION 01

WHY FUELLING IS THE OTHER HALF

You can follow the smartest plan in the world and still go nowhere if you turn up under-fuelled and recover badly. The ride is the signal. The food and the sleep are where your body answers it.

Think of every session as a question you ask your body. Fuel it and let it recover, and the answer is a stronger, faster rider. Skip the fuel, skimp on the recovery, and the same session just digs a hole. Nutrition is not a bolt-on to your training. It is half of it. The leading position stands on sports nutrition are blunt about this, that meeting your energy and carbohydrate needs is a precondition for adapting to training at all [1].

The good news is that fuelling well is not complicated and it is not expensive. Most of the gains come from a handful of habits done consistently. Eat enough. Get carbohydrate in around your hard sessions. Hit your protein. Drink to thirst and replace salt when you sweat hard. Practise your race fuelling before race day. That is most of the game.

> **How to use this guide.**
> You do not have to read it in order. Skim the contents, jump to whatever you need this week, and treat the cheat sheet in Section 14 as your one-page reminder. Where a claim rests on research you will find a small marker like [2] that links to a real, published paper. Follow any link and read the source yourself.

One honest line before we start. This is general education for healthy riders, not individual dietary or medical advice. For personal needs, a specific weight goal, a medical condition or any relationship with food that feels difficult, see a registered dietitian or your doctor. That is not a disclaimer to skip past. It is the right way to get advice that fits you.

SECTION 02

CARBOHYDRATE: YOUR PRIMARY FUEL

For the intensities that make you a better cyclist, carbohydrate is the fuel that matters most. It is the currency your muscles spend when the pace lifts, and running low is one of the surest ways to ride badly.

Your body stores carbohydrate as glycogen in the muscles and liver, and that store is small and precious. A hard ride can drain it in a couple of hours, and as it empties your ability to hold intensity falls away with it [3]. Keeping those stores topped up is the single biggest lever you have over how you feel and perform on the bike.

Daily targets by training load

Your carbohydrate needs are not fixed. They rise and fall with what your training is asking of you that day. The consensus targets from the leading sports-nutrition bodies scale carbohydrate to training load like this [1][4].

Day type	Carbohydrate	For a 70 kg rider
Rest / very easy	3 to 5 g/kg	210 to 350 g
Moderate (1 hr-ish)	5 to 7 g/kg	350 to 490 g
Hard / long (1 to 3 hr)	6 to 10 g/kg	420 to 700 g
Very long / back to back	8 to 12 g/kg	560 to 840 g

The practical version is simpler than the numbers look. On hard and long days, put carbohydrate at the centre of your plate, rice, pasta, potatoes, bread, oats and fruit, and fuel around the session. On genuinely easy or rest days, you naturally need less, so you can ease off the biggest carbohydrate portions without any drama. Matching your intake to the day, sometimes called fuelling for the work required, is a well-supported way to train well while keeping your body composition sensible [5].

Do not fear carbs

Carbohydrate has a bad reputation it does not deserve among endurance athletes. For a cyclist chasing performance, adequate carbohydrate is not the enemy of leanness, it is the fuel that lets you train hard enough to get lean and strong in the first place. Chronically under-eating carbohydrate tends to flatten your best sessions, blunt recovery and leave you riding tired. Fuel the work, and the training does its job.

> **The big idea.**
> Carbohydrate is the fuel of intensity. Scale it to the day, keep it high around your hard and long rides, and stop treating it as something to be feared. A well-fuelled rider trains harder, recovers faster and gets fitter than an under-fuelled one, every time.

SECTION 03

FUELLING ON THE BIKE

Eating while you ride is not just for racers. Taking carbohydrate on board during longer and harder sessions keeps your power up, protects your late-ride numbers and lets you finish sessions you would otherwise fade out of.

The reason is simple. Carbohydrate you eat on the bike spares your limited glycogen stores and keeps fuel flowing to the working muscle, which delays the fade and improves endurance performance [6][7]. How much you need depends on how long and how hard you are going.

Session	Carbohydrate per hour	Notes
Under 60 min	Usually none needed	Water is generally enough; ride fuelled
60 to 90 min	Up to ~30 g/hr	A mouthful of drink mix or half a bar
90 min to 2.5 hr	30 to 60 g/hr	The classic endurance range
Long / hard / racing	60 to 90 g/hr	Needs glucose plus fructose to absorb
Very long / very hard	up to 90 to 120 g/hr	Only if gut-trained; see Section 04

Why the modern numbers went up

For years, 60 g per hour was thought to be the ceiling, because your gut can only absorb so much glucose at once. The breakthrough was realising that glucose and fructose are absorbed by different transporters, so mixing them lets you take in far more total carbohydrate without it sitting in your stomach [8]. That is why modern drinks, gels and chews use a glucose to fructose blend, often around a 1:0.8 ratio, and why intakes of 90 g and even up to 120 g per hour are now used on the longest, hardest days [9]. This higher-carbohydrate approach is now standard in the professional peloton for long, demanding stages [10].

Drink, gel or food?

They all count, so use whatever your stomach tolerates and your session allows.

- Drink mix does two jobs at once, fuel and fluid, and is easiest to sip steadily. It is the backbone of most riders' fuelling.
- Gels and chews are compact, fast and convenient for hard efforts and races, but they need water alongside them.
- Real food, bananas, rice cakes, sandwiches, flapjack, works well on long steady rides and is kinder on the wallet and the palate.

> **Start early, sip often.**
> Do not wait until you feel empty. Begin fuelling within the first 30 to 45 minutes of a long ride and keep it regular, a little and often. Chasing a deficit once you are already low rarely works, because your gut cannot absorb fast enough to catch up.

SECTION 04

GUT TRAINING

Your gut is trainable, just like your legs. If you have ever felt sick trying to eat on the bike, the answer is usually not less food, it is a gut that has not been taught to handle it yet.

Taking in 90 or 120 g of carbohydrate an hour is a skill your digestive system has to learn. The good news is that the ability to absorb carbohydrate during exercise, and to tolerate it without stomach trouble, genuinely improves with practice [11]. Riders who feed regularly in training tolerate high intakes far better than those who only try it on race day.

A practical progression

1. Start where you are. Take your current comfortable intake, perhaps 40 to 50 g per hour, and make it consistent on every long ride for a couple of weeks.

2. Add gradually. Nudge up by roughly 10 to 15 g per hour every week or two, using a glucose plus fructose mix so your gut can actually absorb it.

3. Practise at target intensity. Feeding is harder when you are riding hard, so rehearse your race-day rate during some harder efforts, not only easy spins.

4. Rehearse the real thing. In the final weeks before a big event, do a couple of key long rides using the exact products and the exact hourly rate you plan to race on.

> **Never try anything new on race day.**
> Every product, flavour and hourly rate you intend to use in an event should be tested in training first. The start line is the worst possible place to discover a gel does not agree with you. Gut training turns high-rate fuelling from a gamble into a plan.

SECTION 05

PROTEIN

If carbohydrate fuels the work, protein rebuilds you afterwards. It is the raw material for repairing muscle, adapting to training and holding on to the strength you have built.

Endurance cyclists often under-eat protein because they focus so hard on carbohydrate. But you are breaking down and rebuilding muscle with every hard session, and you need enough protein to come back stronger rather than just recover to baseline. The evidence-based daily target for athletes sits at roughly 1.6 to 2.2 g per kilogram of body weight, well above what a sedentary person needs [12][13]. For a 70 kg rider that is about 110 to 155 g a day.

Spread it across the day

How you distribute protein matters as much as the total. Your body uses protein for muscle repair most effectively when you feed it in moderate doses spread across the day rather than in one big hit. Aim for roughly 20 to 40 g of quality protein per meal, three or four times a day, which keeps the rebuilding

process topped up [14][13]. A dose in the couple of hours after a hard session, and one before bed, are both sensible anchors.

Sources

Meat, fish, eggs, dairy and whey are all rich, complete sources. Plant-based riders can absolutely hit their targets too, they just need a slightly higher total and a good spread of sources, beans, lentils, tofu, tempeh, soya and a quality plant protein powder, to cover all the building blocks. More on that in Section 12.

> **Needs rise with age.**
> Older muscle responds a little less readily to protein, so masters riders benefit from sitting at the top of the range and hitting a solid 30 to 40 g per meal. Female riders through and after the menopause have higher protein and bone-support needs too. Both are covered in Section 12.

SECTION 06

FAT AND THE BIGGER PICTURE

Fat is not the enemy and it is not magic. It is an essential part of your diet and your single largest fuel store, but for the intensities that make you fast, carbohydrate still wins.

Dietary fat matters for hormones, for absorbing certain vitamins and for a diet you can actually live on. And your body carries an enormous fat store that powers your easy riding all day long. Steady Zone 2 riding trains you to burn more fat at a given pace, which spares glycogen, and that is one of the quiet benefits of a big aerobic base.

Train low and fat oxidation, in context

You will hear about "train low" strategies, doing some easy sessions with low carbohydrate availability to push adaptations that improve fat burning [5][15]. There is real science here, and a carefully placed easy fasted ride can have a role. But it comes with a trade-off, and it is important to be honest about it.

When researchers pushed this to the extreme with genuine low-carbohydrate, high-fat diets in elite endurance athletes, performance at race intensity got worse, not better, because burning fat costs more oxygen than burning carbohydrate and the body became less economical at speed [16]. In plain terms, better fat burning does not replace carbohydrate when the pace lifts. It complements it. For the hard, decisive efforts, you still need carbohydrate available.

> **The honest summary.**
> Eat enough fat to be healthy, build fat-burning through steady aerobic volume, and keep carbohydrate high when you train and race hard. Fat fuels the easy miles. Carbohydrate wins the hard ones. You want both, matched to the job.

SECTION 07

HYDRATION AND ELECTROLYTES

Getting hydration roughly right is easy and matters a lot. Getting it exactly right is a rabbit hole most riders do not need to enter. Drink sensibly, replace salt when you sweat hard, and do not overthink it.

The most reliable everyday guide is to drink to thirst. For the vast majority of rides, letting thirst lead, rather than forcing down a rigid schedule or drinking as much as humanly possible, keeps you in the safe, well-hydrated middle ground [17]. Starting a ride already well hydrated does more good than heroic drinking mid-ride.

Sweat rate and sodium

How much you need depends on how much you sweat, which varies hugely between riders and shoots up in the heat. A simple way to learn yours is to weigh yourself before and after a hard hour, ideally undressed and towelled dry. Each kilogram lost is roughly a litre of sweat, and that gives you a personal target to aim at on similar days [17]. Sweat also carries salt, so on long, hot or very sweaty rides, adding sodium to your drink helps you hold fluid and stave off cramp and that hollow, flat feeling. This matters even more on long off-road and gravel days where feeding and drinking are less regular [18].

Riding in the heat

Heat raises your sweat rate, your fluid needs and your sodium losses all at once, and it makes fuelling harder because blood is diverted to the skin to cool you. Plan for more fluid and more salt on hot days, start cool and well hydrated, and do not chase power numbers that the heat has quietly stolen. If you have a hot event coming, a short block of heat acclimation makes your body sweat sooner and hold more fluid, and it is one of the best-supported preparations for racing in the heat [19].

> **Do not over-drink.**
> Drinking far more than you sweat is not safer, it can dangerously dilute your blood sodium. Thirst is a good guide, not a weakness. Aim to finish rides pleasantly thirsty, not sloshing.

SECTION 08

FUELLING BY SESSION TYPE

Different sessions have different jobs, so they have different fuelling. Here is the expanded version of the quick table in your plan user guide, covering what to do before, during and after each type of ride.

Session	Before	During	After
Recovery	Normal meals, no special prep	Water; nothing needed	Just eat your normal balanced meals
Easy endurance	Light carb meal 1 to 2 hr before, or ride fasted if easy	Water; food only if over ~90 min	A normal meal with carbs and protein
Long endurance	Solid carb meal 2 to 3 hr before	30 to 60 g/hr carbs, start early, add sodium if hot	Carbs plus 20 to 40 g protein soon after
Intervals / hard	Carb meal 2 to 3 hr before; fuel properly, never fasted	Drink mix or gel; 30 to 60+ g/hr on longer sets	Carbs plus 20 to 40 g protein within a couple of hours

Two rules run through the whole table. First, the harder and longer the session, the more it matters that you arrive fuelled and feed during it. Never do your best interval or threshold work fasted, you will simply produce less and gain less from it [20]. Second, easy and recovery rides are exactly where you can afford to keep fuelling relaxed, which is part of matching intake to the work.

> **Match the plate to the day.**
> If your plan shows a big interval block or a long endurance ride tomorrow, tonight's dinner and tomorrow's breakfast should be carb-forward. If tomorrow is a rest day, they simply do not need to be.

SECTION 09

RECOVERY NUTRITION

Recovery nutrition is where a hard session becomes fitness. Get carbohydrate and protein back in, get enough sleep, and above all eat enough across the whole day, and your body does the rest.

After a hard or long ride you have two jobs, refill glycogen and give your muscles the protein to repair. A meal or snack combining carbohydrate with 20 to 40 g of protein does both, and it is the simplest, most reliable recovery habit there is [14].

The "window" is real but oversold

You will have heard about the anabolic window, the idea that you must eat within a strict half hour or lose the gains. The honest picture is more relaxed. Eating soon after helps most when you are training again within a few hours, or when you rode fasted, but for most riders on most days, your total intake across the whole day matters far more than nailing a narrow window [21]. Hit your daily carbohydrate and protein and you are recovering well, whether or not you sprinted to the kitchen.

Sleep and under-fuelling

Sleep is when much of the repair actually happens, so protecting it is part of nutrition. And the biggest recovery mistake is not a mistimed shake, it is simply not eating enough. Chronic under-fuelling, where your energy intake fails to cover your training and daily life, wrecks recovery, hormones, bone health and

performance. This is the territory of relative energy deficiency in sport, and it is a genuine risk for endurance athletes who both train hard and under-eat [22].

> **Recovery is built, not rushed.**
> Eat enough over the whole day, get carbohydrate and protein back in after hard sessions, and sleep well. Do those three consistently and you will out-recover any clever timing trick. If you are constantly flat, ravenous or not adapting, look at your total intake first.

SECTION 10

EVENT-DAY FUELLING

A big event is not the day to improvise. Your fuelling should be as rehearsed as your legs, so that on the day you simply run a plan you already know works.

The days before

For events lasting longer than about 90 minutes, going in with full glycogen stores pays off. In the day or two before, lift your carbohydrate intake towards 8 to 12 g per kilogram while you taper the riding down, which tops up the tank without adding fatigue [23]. This is carbohydrate loading, and for a long sportive or road race it is worth real, measurable time.

The pre-event meal

Eat a familiar, carb-rich, lower-fibre meal around 2 to 4 hours before the start, big enough to fuel you but settled enough not to sit heavy [23]. Porridge, toast and honey, rice or a bagel are classics for a reason. Top up with a small snack or gel in the final hour if it suits you.

During the event

Run the hourly carbohydrate rate you trained for in Section 03, and start early. For a long, hard event that means 60 to 90 g per hour, or up to 120 g if you have gut-trained for it, taken as a steady drip of drink, gels and food rather than in occasional lumps. Keep drinking to thirst and add sodium when it is hot or the day is long.

> **Practise nothing new on race day.**
> Every gel, every bar, every drink and every hourly rate should have been tested on your longest training rides. If it has not been rehearsed, it does not go in the race pockets. The plan on the day is the plan you already proved in training.

SECTION 11

BODY COMPOSITION DONE SAFELY

Many riders want to be leaner, and there is nothing wrong with that. But the way to a strong power-to-weight ratio is to fuel your performance, not to starve it. Under-fuelling is the fast route to riding worse, not better.

Here is the trap. Cut your food hard and the weight might drop for a while, but so does your power, your recovery, your immune function and your enthusiasm to ride. You end up lighter and slower, which is the opposite of the goal. The framework that keeps this healthy is adequate energy availability, making sure you are eating enough to cover both your training and the basic running of your body [22]. When energy availability stays adequate, your body composition can improve gently as a by-product of good training and good food, without the wheels coming off.

If a specific weight goal matters to you, the sensible path is patient, modest, and built around fuelling your key sessions properly while trimming elsewhere. Small changes, held steady over months, beat aggressive restriction every time, and they do not cost you the training you are trying to improve.

> **Get individual support for weight goals.**
> Body composition is personal, and it is easy to get wrong in ways that harm both health and performance. For a specific weight or body-composition target, work with a registered dietitian who can build a plan around you as an individual. This guide deliberately gives you principles, not a diet.

SECTION 12

SPECIAL CONSIDERATIONS

The principles are the same for everyone, but a few groups have specific needs worth calling out. Find yourself here and adjust accordingly.

Masters riders

As we age, muscle responds a little less readily to protein, so masters riders should sit at the top of the protein range and hit a solid 30 to 40 g per meal, with an emphasis on the post-session and pre-bed doses [24]. Recovery also takes a touch longer, so total daily fuelling and sleep matter even more.

Female riders and the menopause

Female-specific nutrition is an emerging area, and individual needs vary, but a few themes are well supported. Female riders benefit from not under-fuelling, protecting bone health, and being alert to iron. Through and after the menopause, protein needs and bone-support needs rise, and pairing good protein intake with strength work protects muscle and bone [25]. Iron deserves particular attention, because heavy menstrual bleeding is a common and often missed cause of low iron in female athletes, which quietly saps endurance [26]. If you are frequently flat and washed out, ask your doctor to check your iron status rather than guessing or self-supplementing.

Plant-based riders

A plant-based diet works well for cyclists with a little planning. Aim for a slightly higher total protein target, spread quality plant sources across the day, and consider a plant protein powder to make hitting per-meal doses easy. Keep an eye on iron, vitamin B12, which needs supplementing on a vegan diet, and vitamin D.

GI issues and caffeine

If you struggle with stomach trouble on the bike, gut training in Section 04 is your first fix, alongside using glucose plus fructose blends and avoiding very concentrated drinks. Caffeine, covered next, is a genuinely effective aid but is a diuretic and a gut irritant for some, so rehearse your dose in training rather than debuting it on race day.

> **Individual needs vary most here.**
> These groups are exactly where general guidance runs out soonest. If any of this applies to you and you want it dialled in, a registered dietitian who works with athletes is money well spent.

SECTION 13

SUPPLEMENTS THAT ARE WORTH IT (AND THE ONES THAT ARE NOT)

Almost all of your gains come from food, sleep and training. But a short list of supplements has genuine, repeated evidence behind it, and a long list does not. Spend your money on the first list and ignore the second.

The ones with real evidence

- Caffeine. One of the most reliable performance aids we have, improving endurance and reducing perceived effort. Around 3 to 6 mg per kilogram, taken roughly 60 minutes before, is the evidence-based dose. Rehearse it in training [27].
- Creatine. Best known for strength and sprint work, and well supported for exactly those. Useful if you sprint, do gym work or want to support repeated high-power efforts, at around 3 to 5 g a day [28].
- Nitrate / beetroot. Dietary nitrate can reduce the oxygen cost of riding and modestly help endurance, most usefully in the hours before an event [29].
- Bicarbonate. Sodium bicarbonate buffers acidity and can help repeated high-intensity efforts, the kind found in crits and hard climbing. It genuinely works, but the dose that helps also upsets some stomachs, so it must be trialled carefully [30].
- Beta-alanine. Another buffer, taken daily over weeks, with modest support for high-intensity efforts lasting one to several minutes [31].
- Vitamin D. Not a performance booster if you are already replete, but correcting a genuine deficiency supports bone and muscle health. Worth testing, especially through a dark winter, and supplementing if you are low [32].

The ones to skip

Save your money on BCAA supplements, which add little if your total protein is adequate, and on so-called fat-burners, which are at best useless and at worst risky. The vast majority of colourful tubs promising an edge do not have the evidence to back them. If a product's marketing is louder than its research, treat that as your answer.

> **Food first, always.**
> No supplement rescues a poor diet or missed sleep. Get the basics right for months first, then add one or two evidence-backed aids if your riding warrants it. And never introduce a new supplement in an event, rehearse everything in training.

SECTION 14

QUICK-REFERENCE CHEAT SHEET

The whole guide in one glance. Pin this somewhere useful and you have the numbers that matter, ready to hand.

Daily fuelling

- Carbohydrate: 3 to 5 g/kg on easy/rest days, 5 to 7 g/kg on moderate days, 6 to 10+ g/kg on hard and long days.
- Protein: 1.6 to 2.2 g/kg per day, spread as 20 to 40 g across three or four meals.
- Fat: enough to be healthy; fuels your easy miles, but keep carbs high when you go hard.

On the bike

- Under 60 min: water is usually enough.
- 60 to 90 min: up to ~30 g/hr.
- 90 min to 2.5 hr: 30 to 60 g/hr.
- Long / hard / racing: 60 to 90 g/hr, glucose plus fructose.
- Very long / very hard: up to 90 to 120 g/hr, only if gut-trained. Start feeding early.

Recovery, hydration and event day

- After hard rides: carbs plus 20 to 40 g protein; total daily intake matters most.
- Hydration: drink to thirst; add sodium when hot, long or sweaty.
- Event day: carb-load 8 to 12 g/kg the day or two before, carb-rich meal 2 to 4 hr before, run your trained hourly rate, and practise nothing new.

SECTION 15

REFERENCES

Every claim that rests on research links to a paper below. These are real, published, peer-reviewed sources on PubMed. Follow any link and read the original for yourself.

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FUEL THE WORK, RECOVER WELL, LET THE TRAINING DO ITS JOB.

Bryn Griffith, Evolve Coaching