

The Overlooked Role of Taste and Texture in Athletic Performance

Most conversations about sports nutrition orbit the same handful of metrics. Grams of carbohydrate per hour. Milligrammes of sodium per litre. Calories burned, calories replaced, the careful arithmetic of fuelling a body through hours of sustained effort. What rarely gets discussed, at least not with the same seriousness, is something far more primitive: whether the stuff actually tastes any good going down at mile eighteen.

This is not a trivial concern. Ask anyone who has finished a marathon doubled over at the side of the road, or abandoned a century ride because they simply could not face one more sweet, syrupy mouthful, and they will tell you that the sensory experience of eating during exercise is its own performance variable. The gut does not care about your fuelling spreadsheet. The tongue rebels in ways that no training plan accounts for. And the difference between an athlete who finishes strong and one who falls apart in the final third often comes down to whether they could keep swallowing what they had packed.

The science here is genuinely interesting, and most amateur athletes never engage with it until something goes wrong. Flavour fatigue, mouthfeel preferences, stomach tolerance under stress – these sit at the intersection of physiology and psychology in a way that pure carbohydrate maths cannot capture. Surveys of long-distance runners and triathletes have found prevalence rates of exercise-induced gastrointestinal symptoms ranging from 30% to 90%, depending on event type and intensity, with one study of long-distance triathletes in extreme conditions reporting a prevalence of up to 93% for at least one GI symptom. They explain why elite athletes spend almost as much time experimenting with flavours as they do training their bodies, and why two runners with identical fuelling plans can have wildly different outcomes on the same course. This article looks at that underexplored territory: why taste and texture matter more than most athletes realise, and what you can do about it before your next big event.

When Your Mouth Stages a Revolt: The Reality of Flavour Fatigue

There is a particular moment, somewhere deep into a long endurance event, when an athlete reaches into their pocket, pulls out the next planned fuel, and physically cannot bring themselves to put it in their mouth. The body still needs the calories. The plan still calls for it. But the tongue has lodged a formal complaint, and no amount of rational thinking seems to override it.

This phenomenon has a name. Sports nutritionists call it flavour fatigue, sensory-specific satiety, or sometimes just appetite suppression under load. The mechanism behind it is well documented in food science research, though it took the endurance community a surprisingly long time to take it seriously. The concept was first described in 1956 by the French physiologist Jacques Le Magnen, and the term “sensory-specific satiety” itself was coined by researchers Barbara Rolls and Edmund Rolls in 1981. The basic idea is that the brain registers diminishing reward from repeated exposure to the same taste, even when the body still needs the nutrient that taste represents. This is a normal protective response in everyday eating. It is what stops you from eating the entire jar of peanut butter in one sitting. During a six-hour bike ride, however, it becomes a serious problem.

What makes endurance exercise particularly brutal in this regard is the intensity of the repetition. A cyclist working through a long ride might consume the same gel or chew every twenty minutes for five hours straight. That is fifteen identical flavour exposures in a single session, often the same product they trained with for months beforehand. With [current sports nutrition guidelines recommending 60–90 grams of carbohydrate per hour](#) for events lasting longer than two hours, and trained athletes sometimes targeting up to 120 grams per hour, the sheer volume of repeated intake makes monotony almost inevitable. By hour three, the sweetness that seemed pleasant at the start has become genuinely revolting. By hour four, athletes start gagging at the smell.

How sweetness compounds the problem

Most packaged sports nutrition skews aggressively sweet, and there is a reason for this beyond marketing. Simple sugars are the fastest-absorbing carbohydrate source, and concentrated sugar solutions hold up well in pocket-friendly packaging. Most commercially available isotonic sports drinks contain a 4–8% carbohydrate

concentration, equating to roughly 40–80 grams of sugar per litre. The result is a product category where almost everything tastes like a melted boiled sweet. This works in your favour for the first hour. It works against you for everything after that.

Sweetness sensitivity actually increases with exertion. Several studies have shown that the same sugar concentration registers as more intensely sweet during exercise than at rest, which means the products engineered for palatability in the lab become disproportionately cloying out on the road. Athletes describe the sensation as their mouth feeling coated, their throat resisting another swallow, their stomach turning before the gel even reaches it.

Salt as the unexpected hero

This is partly why savoury options have become so popular in ultra-endurance circles over the last decade. Pretzels, broth, salted potatoes, miso soup at aid stations — these are not fashionable choices, they are physiological rescues. The shift from sweet to savoury resets the palate in a way that allows fuelling to continue. Ultra-endurance research consistently reports that as race duration increases, the appeal of sweet flavours declines and athletes shift their preference toward salty and savoury options — a pattern sometimes labelled “sweet fatigue” in the nutrition literature. Some athletes report being able to eat hundreds more calories simply by alternating between two distinct flavour profiles rather than hammering away at the same one.

The takeaway here is not that sweet products are bad. It is that monotony is the enemy, and that the longer the event, the more aggressively you need to plan around it. Carrying four flavours of the same product is better than carrying four packets of one flavour. Throwing a handful of salted crisps into your kit bag is not amateur behaviour. It is what experienced athletes do when they have learned, the hard way, that the mouth has veto power over the best-laid fuelling plan.

The Texture Problem Nobody Warns You About

If flavour fatigue is the well-known villain of long-distance fuelling, texture is its quieter accomplice. It rarely gets discussed in training plans or product reviews, yet it accounts for an enormous share of in-event fuelling failures. The mouth, it turns out, is just as opinionated about how something feels as it is about how it tastes.

Anyone who has tried to choke down a thick, syrupy gel while breathing hard up a climb knows the sensation. The texture is somewhere between honey and wallpaper paste. It sticks to the roof of the mouth. It refuses to be swallowed cleanly. You end up needing water just to clear the residue, which is precisely the moment you realise your bottle is empty and the next aid station is four miles away. This is not a manufacturing flaw. It is the inherent trade-off of packing a hundred calories of fast carbohydrate into a sachet small enough to fit in a running belt.

Why mouthfeel matters more during exercise

The physiological context here is worth understanding. During hard effort, saliva production drops. Breathing shifts to the mouth, drying out the oral cavity further. Blood is shunted away from the digestive tract toward working muscles, which slows gastric emptying and makes the stomach more sensitive to anything arriving in concentrated form. At rest, the digestive system receives roughly 1,500 mL of blood per minute, or about 25% of cardiac output; during hard exercise, that can drop to around 350 mL per minute, or as little as 5% of cardiac output. All of this means that textures which feel perfectly fine on the sofa become genuinely difficult to manage at threshold pace.

This is where [electrolyte gel](#) and similar concentrated formats run into trouble for sustained intake. The very thing that makes them efficient — high mineral or carbohydrate density in a small volume — is what makes them harder to consume hour after hour. A product that delivers a useful dose in three seconds of swallowing time still has to pass through a dry, stressed throat and into a stomach that has slowed to a crawl. Multiply that across an entire event and the cumulative resistance becomes a real factor.

The contrast principle

What experienced endurance athletes figure out, often after several bad days, is that texture variety matters as much as flavour variety. Switching between thin liquid drinks, chewy solid blocks, dry crunchy crackers, and gel-style products gives the mouth a sequence of distinct sensations to work with. Each format engages slightly different muscles, prompts different swallowing reflexes, and clears the palate differently. The contrast itself is the point.

Some athletes go further and deliberately build texture transitions into their fuelling plan. A gel followed by a salted cracker followed by a sip of drink mix creates a sort of mouth-cleansing sequence that allows the next round of concentrated fuel to land more easily. This sounds fussy until you have stood at the finish of an ultramarathon and watched the difference between athletes who managed their intake and those who simply could not get enough calories down. One analysis of 100-mile ultras found that successful finishers consistently consumed more than 250 kcal per hour, while non-finishers averaged under 200 kcal per hour – a gap that often traces back not to willpower but to the inability to keep getting fuel down.

Temperature and texture interaction

One last factor worth flagging is temperature, which affects texture in ways most athletes underestimate. A gel that flows easily at room temperature can turn into something approaching toffee when chilled in a cold-weather race. The same product on a hot summer ride becomes uncomfortably warm, almost soup-like, in a way that triggers a different kind of gag response. Bars become brittle in winter and sticky in summer. Drinks that taste fine at fourteen degrees Celsius taste like medicine at twenty-six.

None of these issues are solvable through better training. They require planning, packaging awareness, and a willingness to test products in the actual conditions you expect to race in. The athletes who never seem to have fuelling problems are usually the ones who have learned to take texture as seriously as they take everything else.

The Gut Under Pressure: Why Your Stomach Becomes Unpredictable

There is a peculiar humility that comes from having your digestive system stage a public failure during a race. It does not matter how fit you are, how disciplined your training has been, or how carefully you weighed out your carbohydrate intake the night before. When the gut decides it has had enough, the conversation is over. You are now searching for portable toilets, or worse, accepting that the next mile is going to be deeply unpleasant.

This is one of the dirty secrets of endurance sport, and it is more common than the marketing photos suggest. Surveys of long-distance runners and triathletes consistently

find that somewhere between thirty and ninety percent report some form of exercise-induced gastrointestinal distress, with the rate climbing alongside event duration and intensity. In one study of a 161-km ultramarathon, 96% of runners reported at least one GI symptom, with nausea, belching and flatulence the most common complaints; 35.6% of non-finishers cited GI symptoms as a reason for dropping out, and in a survey of Western States and Vermont 100 competitors, nausea and vomiting were the single most common cause of DNF at 23%. The numbers are particularly grim at the ultra end of the sport, where many drop-outs trace back not to muscular failure but to a stomach that simply stopped cooperating.

What changes inside you when you start working hard

Understanding why this happens makes the whole picture easier to manage. During sustained hard effort, your body makes a series of physiological choices that prioritise survival over digestion. Blood flow to the digestive tract can drop by up to eighty percent as it is diverted to working muscles and the skin for cooling. One study showed that at the onset of steady-state exercise, portal blood flow decreased by 20% within 10 minutes and by 80% after one hour of running at 70% of VO₂max. The gut wall itself becomes more permeable under prolonged stress, a phenomenon researchers have linked to inflammation and the so-called leaky gut response sometimes seen in marathon finishers.

The mechanical side compounds the chemistry. Running, in particular, subjects the abdominal contents to constant jostling. GI distress is around twice as common in runners as in cyclists or swimmers, largely because of the repeated mechanical impact on the abdomen. Cycling places the rider in a hunched position that compresses the stomach. Add the pounding of pavement, the heat of summer racing, and dehydration that thickens digestive secretions, and you have an environment where even familiar foods can betray you.

The osmolality factor

This is where product selection genuinely matters, and where many athletes go wrong without realising it. Osmolality is the measure of how concentrated a solution is in dissolved particles, and your stomach is fussy about it. Solutions that are too concentrated draw water into the gut rather than absorbing efficiently across the intestinal wall, which is exactly the opposite of what you want during a hot race when

fluid retention is already a challenge. Blood plasma sits at around 275–295 mOsm/kg, and most sports nutrition research suggests targeting drink osmolality below roughly 330 mOsm/kg to minimise GI symptoms; beverages above 500 mOsm/kg significantly delay gastric emptying.

Most packaged sports nutrition is engineered to land in a specific osmolality range, but consuming multiple high-concentration products back to back can push the cumulative load past what your gut can handle. An electrolyte gel washed down with a sugary drink and a couple of chews in quick succession is functionally different from the same total intake spaced out over thirty minutes with plain water in between. The athletes who get this right tend to think in terms of fuel delivery rate rather than total calories, and they pay close attention to what they pair with what.

The trainability of digestion

Here is the genuinely useful news. The gut is trainable. This is one of the more recent and practical findings to come out of sports nutrition research, and it has changed how serious endurance athletes prepare for big events. Repeated exposure to fuelling during training sessions appears to upregulate the intestinal transporters responsible for absorbing carbohydrate, increase tolerance for higher osmolality solutions, and reduce the symptomatic response to in-event eating. Without specific gut training, [most athletes can comfortably absorb around 60 grams of carbohydrate per hour](#), but with as little as two weeks of consistent gut training, the majority can reach 90 grams per hour or more, with some pushing 120 grams per hour using glucose-to-fructose ratios of around 1:0.8.

In practical terms, this means that the long training run is not just about getting your legs ready. It is about getting your stomach ready. Athletes who fuel during every long session, deliberately practising with the exact products they plan to race with, generally show up on race day with a gut that knows what to expect. Those who train fasted and then suddenly try to consume sixty grams of carbohydrate per hour in their first marathon are setting themselves up for an unhappy surprise. Coaches typically recommend beginning a structured gut-training block six to ten weeks before a goal event, starting at a comfortable baseline (often around 30 g/h) and adding roughly 10 g/h per week.

The stress multiplier

The last factor that deserves attention is the brain-gut connection, which becomes particularly relevant on race day. Anxiety, adrenaline, and the disrupted sleep that precedes most events all influence digestive function. Athletes who feel perfectly fine eating a particular product on long training rides sometimes find the same product impossible to keep down at the start of a goal race. This is not weakness. It is the autonomic nervous system doing its job, and the only real countermeasure is exposure: more starts, more pressure, more practice fuelling under genuine race conditions until the response dampens.

The athletes who appear to have iron stomachs almost always turn out, on closer inspection, to be the ones who have done the unglamorous work of training their digestion as carefully as they trained everything else.

How the Best in the World Obsess Over Flavour Rotation

If you ever get the chance to look inside a professional cyclist's musette or a top trail runner's drop bag, the contents are rarely what you might expect. There is variety, often startling variety, and almost none of it looks like a clean execution of a single product line. Three different gel flavours. Two brands of chew. A small ziplock of salted boiled potatoes. A flask of something custom-mixed at half-strength. The packaging is sometimes scribbled on with arrival times. The whole assembly looks more like a tasting menu than a fuelling plan.

This is not coincidence, and it is not athletes being precious. It is the result of hard-won experience at the upper end of the sport, where small fuelling improvements translate directly into measurable performance gains. The athletes who have figured out how to keep eating across very long efforts have almost universally arrived at the same conclusion: variety wins.

The aid station as a buffet, not a refuelling stop

Watch the lead group of any major ultra-distance race and you will see this principle in action. Athletes spend longer at aid stations than amateurs expect, not because they are slow but because they are sampling. They take a sip of broth, a few crisps, half a sandwich, maybe a piece of fruit. They are not packing in calories so much as resetting

their palate before the next stretch of monotonous gel-and-water consumption on the trail. Race finish data backs this up: famously punishing events like the Badwater 135 see DNF rates of up to 40%, and the Leadville 100 recorded a DNF rate of around 56% in 2023, with GI distress consistently cited as one of the leading non-injury reasons athletes pull out.

The team support side of professional cycling takes this even further. Soigneurs prepare custom feed bags with rotating contents, deliberately mixing sweet and savoury, soft and crunchy, familiar and novel. Riders communicate during races about what they can and cannot face. A bag intended for a rider in distress will look quite different from one prepared earlier in the day. The fuelling strategy adapts in real time to whatever the athlete's mouth and stomach are willing to accept.

Pre-event flavour mapping

What separates serious athletes from casual ones, perhaps more than anything else, is the time they spend before a race mapping out exactly which flavours go where. This sounds excessive until you try it. The idea is that you sequence your products to match the emotional and physical arc of the event. Lighter, more pleasant flavours sit at the start when your palate is fresh and your stomach is patient. Stronger, more savoury, or more intense options are held back for the hours when you know things will be difficult.

Some athletes go as far as labelling individual gels with the mile marker or hour they intend to consume them. The exercise itself is useful even if you do not follow the plan precisely. It forces you to think honestly about which products you will actually want to eat at hour five, rather than which ones you happened to grab in bulk at the shop.

The cross-training of the palate

There is another habit worth noting, which is that experienced endurance athletes deliberately train themselves to enjoy a wider range of in-race foods than feels natural. Acquired tolerance is a real phenomenon. The runner who initially gags at the idea of warm broth in the middle of a marathon will, after a few exposures, come to look forward to it. The cyclist who finds rice cakes too plain at first eventually learns to appreciate them as a welcome break from sweet packaged options.

This works in the other direction too. Athletes who eat very clean diets in everyday life sometimes struggle with the sweetness of standard sports products, while those whose

normal diet includes more sugar tolerate the intensity better during exercise. There is no moral hierarchy here. It is simply useful to know that your everyday eating shapes what your palate will accept under stress, and that small dietary adjustments in the weeks before a goal event can make in-race fuelling noticeably easier.

The role of personal coding

One final practice worth mentioning, common among long-course triathletes and ultrarunners, is the use of what some athletes call flavour anchors. The idea is that you associate particular tastes with particular phases of the race, almost like a soundtrack. A specific flavour might be reserved for the moment you reach a certain landmark, or for the recovery phase after a hard climb. The psychological cue becomes part of the pacing strategy.

This sounds like sports psychology dressed up as nutrition, and to some extent it is. But the mental side of endurance racing is inseparable from the physical, and athletes who give themselves something to look forward to in their pocket tend to fuel more consistently than those who treat every gel as identical. The flavour you genuinely want at mile twenty is the flavour you will actually eat at mile twenty, and that, in the end, is what matters.