SUPPLEMENTS
A DOSE OF REALITY

Contaminants, dubious benefits and accidental megadoses – *Anita Bean* exposes the uncomfortable truth about the supplements many cyclists trust

Illustrations Daniel Baines

I never thought of myself as a big supplements user. Like many cyclists, I took a handful of products: a multivitamin, vitamin D, magnesium, protein powder and creatine. Then I came across a thread by environment writer George Monbiot describing how he accidentally overdosed on vitamin B6, taking 14 times the recommended daily amount because it was hidden in high doses inside his plant-based B12 complex supplement. He warned that excessive B6 intake can lead to severe nerve damage.

It made me curious about my own supplement routine. I noticed that vitamin D was in three of my products, including the magnesium complex supplement. Altogether I was consuming 120mcg – substantially more than the recommended safe upper intake level of 100mcg. In fact, the NHS recommends adults take just 10mcg of vitamin D a day from October to March. What surprised me most wasn't the amount, it was my assumption that my supplements must be safe and appropriate to use together. If a sports nutritionist like me can overlook something so obvious, how many cyclists are doing exactly the same? That experience made me realise how easy it is to trust the label without asking bigger questions.

Huge market

The UK vitamins, minerals and supplement market is huge: in 2023 it was worth £1.5bn, and had grown by an average of 13.1% annually since 2018. Athletes are particularly keen supplement users: a 2023 review found that 60%-80% of elite athletes take them, at least at certain times of year, typically to support performance, health or recovery. It's not hard to see the appeal. Scroll through social media, listen to cycling podcasts or browse online retailers and you'll find an endless stream of products promising more energy, faster recovery, better sleep, stronger immunity and improved ►


CAUTION

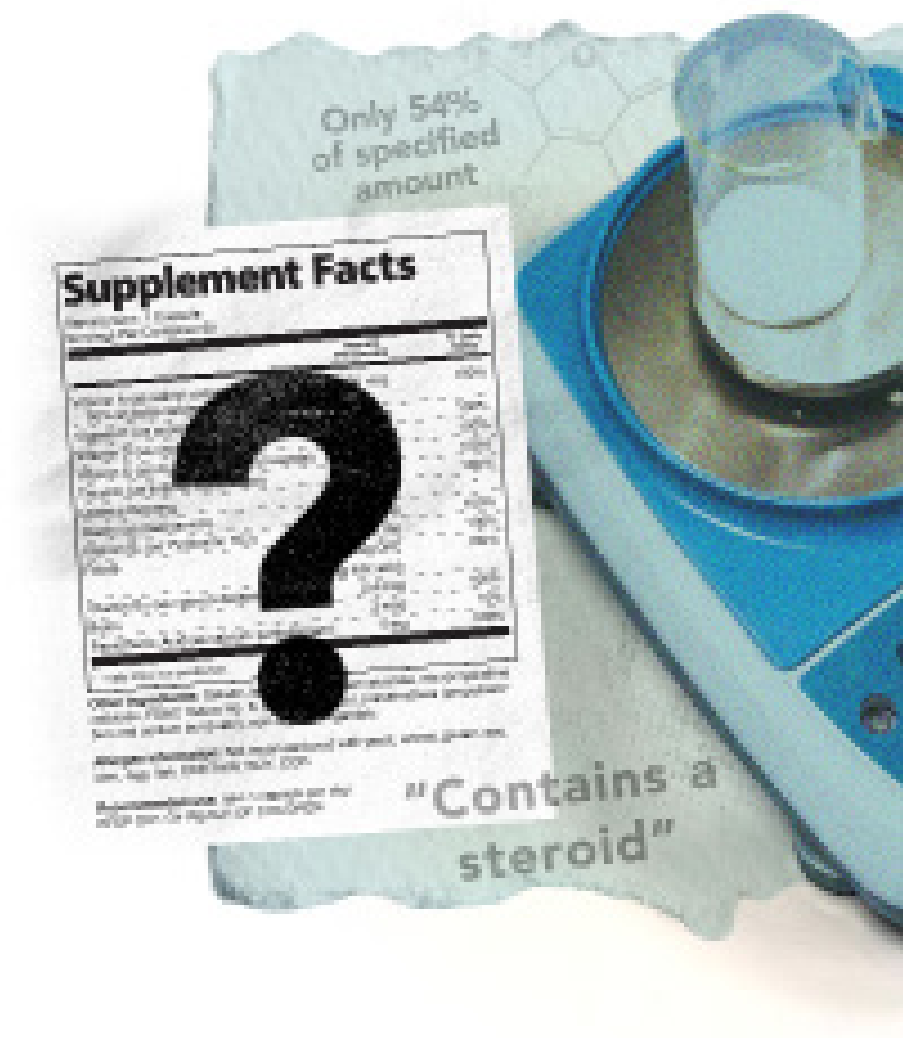
performance. It takes an iron will not to fear you're missing out.

That appeal isn't accidental – as exercise scientist Dr Nick Tiller, author of *The Health and Wellness Lie*, explains: "Athletes care about performance, and years of chasing marginal gains have ingrained an ethos of 'leave no stone unturned'." For cyclists, supplements can seem like another logical way to gain an edge. The problem is that marketing often runs ahead of the science.

"Supplement marketing exploits this mindset with plausible-sounding mechanisms, testimonials and elite athlete sponsorships," says Tiller. It's easy to believe the latest powder or capsule could be the missing piece of the performance puzzle.

Dietary supplements are not required to be approved by the Food Standards Agency before they are sold, and as such, the responsibility for product safety lies with the manufacturing party. "People often assume that supplements are regulated like medicines, which require extensive evidence of quality, safety and efficacy before they can be sold," explains Tiller. "But supplements are regulated as foods, and manufacturers have no obligation to prove that their products are safe or effective. In fact, supplements are usually only withdrawn from the market if there's evidence of harm."

A 2025 *Which?* survey found that 52% of supplement users found the information on the packaging confusing, while only 35% always read the label. One quarter bought supplements through online marketplaces, where it may be harder to establish who made a product or where it originated. So, the fact that a supplement is widely available, even from a reputable company or website, does not mean an independent regulator has checked that it is necessary, effective or even suitable for you. As Tiller puts it, "It's a backward system that serves supplement vendors, not consumers." That leaves a lot more responsibility with the cyclist than most of us realise.



"IT'S EASY TO BELIEVE THE LATEST POWDER IS THE MISSING PIECE OF THE PUZZLE"

Can you trust the label?

Because supplements are not routinely tested by independent regulators before they reach the market, their labels may not reflect the actual contents of the product. According to Tiller, the barrier to entering the supplement market is surprisingly low: "Regulations are lax, and anyone can develop a supplement range and sell it online. I registered as a Food Business Operator as an experiment. The application, which was originally designed for cafes, bakeries and corner shops, took less than four minutes. No exams or pre-market approval. Provided I comply with general food laws, I can now develop a supplement range and sell it online."

That doesn't mean every supplement is poor quality. Most manufacturers produce good-quality products and take quality control seriously. However, as Tiller points out, "A familiar brand name isn't proof that a product is safe, accurately labelled or effective."

Legally, supplements don't even have to contain what's on the label. Regulations generally allow contents



5 SUPPLEMENT MYTHS

Don't get sucked in by marketing hype – here's the spiel to sniff out.

Myth: If it's sold legally, it must have been thoroughly tested

Reality: In the UK, supplements are regulated as foods, not medicines. Manufacturers are responsible for safety and labelling, but most products are not independently tested before they go on sale. Choose reputable brands.

Myth: High-strength supplements work better

Reality: More isn't necessarily better. Taking more than your body needs rarely offers extra benefit and may increase the risk of side effects. Check whether you're already getting the same nutrients from other supplements or fortified foods.

Myth: 'Natural' means safe

Reality: 'Natural' is a marketing term, not a guarantee of safety or effectiveness. Natural ingredients can cause side effects, interact with medicines and should be judged on the quality of the evidence, not where they come from.

Myth: If a pro athlete uses it, it must be effective

Reality: Elite athletes often use supplements under expert guidance for specific reasons. What works for a professional rider may offer little or no benefit to a recreational cyclist. Testimonials are not scientific evidence.

Myth: More supplements mean better performance

Reality: For most cyclists, the biggest gains come from training well, eating well, sleeping enough and recovering properly. Supplements should support those foundations, not replace them.

to fall up to 20% below declared values, and to exceed them by as much as 50%, depending on the nutrient. For example, major discrepancies have been reported between the contents and labels of protein powders – a 2025 survey by LGC Science found one product contained only 54% of the advertised amount. Other investigations, such as the one by Tiller and colleagues in 2024, found the listed carbohydrate content of popular brands of energy gels to be unreliable. Indeed, one product provided less than 30% of the carbohydrate and energy claimed on the label (12.5g versus 45g claimed carbohydrate).

Hidden risk of contamination

Getting less of an ingredient than the label claims is one thing. Finding something that's not supposed to be there is quite another. A 2025 Consumer Reports (CR) investigation tested 23 protein powders and found that more than two-thirds contained lead levels above its own daily safety threshold. Plant-based powders averaged nine times more lead than dairy-based ones and twice as much as beef-based ones. As some reassurance to UK buyers, these were US products – unlike the US, the UK imposes legal limits for lead in supplements. That said, one of the two products CR advised avoiding altogether came from a British brand (which disputes the findings). As ever, the best advice is to get your protein from real food.

In a landmark study published in 2004, researchers analysed 634 non-hormonal dietary supplements from 13 countries and found that 14.8% contained undeclared anabolic steroids or steroid derivatives. A 2008 LGC study of 152 uncertified ►

supplements found that around one in 10 tested positive for substances prohibited in sport. According to Jonathan Murthy, Global Head of Marketing at LGC, "Contamination typically comes from two sources: the raw materials themselves or the manufacturing process."

Is contamination always accidental, or are some products deliberately adulterated? "The answer is both," says Tiller, who points out that lacing mass gainers with steroids or fat burners with stimulants produce powerful results that keep customers coming back. "It's effective and it's profitable."

For competitive cyclists, the consequences can be devastating. Under anti-doping rules, cyclists are responsible for every substance found in their body, regardless of how it got there. In 2018, Slovenian rider Jani Brajkovič, a former Critérium du Dauphiné winner, tested positive for the stimulant methylhexaneamine. The UCI accepted that it came from a contaminated supplement, but he was still banned for 10 months – a sanction that, at 35, threatened to end his career. It's not just professionals at risk: in 2022, US masters track champion Brian Abers was banned for a year after a supplement he'd taken turned out to contain an unlisted growth hormone booster. Even if you're not subject to drug testing, there are good reasons to avoid contaminated supplements. Undeclared steroids and stimulants can carry serious health risks, including hormonal, liver and cardiovascular problems. If it's not on the label, you don't know you're taking it or how much.

When more is too much

Contamination isn't the only concern. It's also possible to have too much of a good thing – as I discovered with vitamin D. A 2025 investigation by *Which?* found supplements on major online marketplaces containing up to 12.5 times the recommended safe upper level for vitamin D. Other products also provided very high doses of vitamin A, vitamin B6 and zinc, sometimes without the recommended safety warnings. Safe upper levels refer to the maximum daily intake unlikely to pose a risk for most healthy adults. They include intake from all supplements and, where relevant, fortified foods.

"People think vitamins and minerals work like a performance upgrade, where a bigger dose gives a bigger benefit," explains Andy Shepherd, performance nutrition lead at Loughborough University. "More isn't automatically better."

The risk of adverse effects increases when people combine multivitamins, single-nutrient tablets, fortified foods, energy drinks and sports nutrition products without realising their total intake. Excess vitamin D can raise blood calcium levels and affect the kidneys, high-dose zinc can interfere with copper absorption, and too much vitamin B6 over time may damage the nerves. "Both deficiency and excess can be harmful, so the aim should be adequacy, not maximum intake," says Shepherd.

This reflects the 'Food first, but not always food only' approach advocated by Graeme Close, professor of human physiology at Liverpool John Moores University: wherever practical,

BEFORE YOU BUY...

Loughborough University's chief of nutrition performance **Andy Shepherd** advises buying from reputable brands, avoiding products making exaggerated claims or sold through unknown online retailers, and, if you may be drug tested, choosing products independently batch tested through programmes such as Informed Sport. UK Anti-Doping recommends a simple three-step approach: assess the need, assess the risk and assess the consequences. Then ask yourself these questions:

Do I actually need it? Ask what problem you're trying to solve. Could you achieve the same result by improving your diet, training or recovery?

Is there good evidence that it works? Look for recommendations based on high-quality research rather than testimonials, influencer endorsements or marketing claims.

Am I already getting this nutrient elsewhere? Check other supplements and fortified foods to avoid unintentionally doubling up.

Am I buying from a reputable company? Choose established brands with robust quality assurance and, if you're subject to anti-doping rules, independently batch tested products.

Have I checked the ingredients and dosage? More is not necessarily better. Avoid products far above the recommended daily intakes or upper safe level.

Have I tried it before an important ride? Never experiment on race day; test it in training first to make sure you tolerate it well.



"SUPPLEMENTS ARE THE ICING, NOT THE CAKE. GET NUTRITION RIGHT FIRST"

nutrients should come from a varied diet, with supplements used to correct genuine deficiencies or meet specific performance needs – not taken 'just in case'.

So, what actually works? For all the products competing for cyclists' attention, relatively few are backed by convincing evidence. Close keeps his list short. "A carbohydrate product for racing – whether that's a drink, gel, chew or shot – is right at the top of the list," he says. "I'd also consider creatine, unless you're particularly concerned about body mass, and in some situations sodium bicarbonate."

Tiller likewise recommends only a handful of routine supplements. "Carbohydrate drinks, gels and bars can improve performance during prolonged or demanding rides, while caffeine has strong evidence, and protein powder can be useful if you're struggling to meet your protein requirements. But most other products are under-studied or supported only by weak evidence."

That advice closely reflects the 2018 International Olympic Committee (IOC) Consensus Statement, which concluded that only a small number of supplements have convincing evidence of benefit, and even then, their effectiveness depends on the individual, the dose, the timing and the context in which they are used.

Close sums it up neatly: "Supplements are the icing, not the cake. Get the nutrition right first, build the training and diet foundation and then consider whether a small handful of supplements might help. None of them make up for missed training miles or a poor overall diet."

Supplements should do exactly what their name suggests: supplement a good diet, not replace it. It's worth remembering that the biggest performance gains come from training well, eating well, sleeping enough and recovering properly. My own experience with vitamin D was a wake-up call. Even as a nutritionist, I hadn't realised how quickly vitamin D from several supplements could add up. It made me look more closely at what I was taking, how much I was getting and whether I really needed it.

Perhaps the biggest lesson is not that supplements are unsafe, but that they shouldn't be treated like medicines. They're regulated as foods, not medicines, which means much more responsibility falls on us as consumers to choose wisely, scrutinise labels and be aware that what's in the tub may not always match what's printed on it. If you compete, choose products independently batch tested through programmes such as Informed Sport to reduce the risk of contamination. And if you suspect a deficiency, seek advice from a qualified sports nutritionist, dietitian or doctor, who can advise whether testing and supplementation are actually needed.

● **Anita Bean** will be keeping a closer eye on her supplement labels from now on.

