



What are you made of?

Body fat can be an obsession with cyclists, but how do you measure it, and what is the right amount? *Cyclist* takes the tests to find out

Words JAMES SPENDER Photography GEOFF WAUGH

Cycling is all about power-to-weight ratio, right? Increase the power, drop the weight and physics says you'll go quicker. Well, it's a bit more complicated than that.

'Who needs to lose weight? Nobody. Fat, maybe. Muscle, if it's not useful for your sport, but not weight per se. That's where body composition analysis comes in, and that's where we can help,' says Phil Chant, director of Bodyscan, a chain of clinics that offers body composition analysis to anyone from professional athletes to taxi drivers.

'So what you're lying on now is a DEXA scanning machine,' Chant adds, as a large grey mechanical arm makes whirring sweeps up and down my semi-naked body. 'DEXA stands for

Dual-energy X-ray absorptiometry, which means it's basically a very mild X-ray scanner. About 5,000 times less radiation than a CT scan in fact, so entirely safe. Right, you can sit up and put your shirt back on now, you're done.'

The whole scan has taken less than five minutes, and before I'm fully dressed Phil is already brandishing a sheaf of papers he's just pulled from the printer, the foremost of which has some interesting looking images of a human body. Or more precisely, my human body.

'DEXA is a three-compartment model,' he adds, pointing to the first image. 'It measures bone, highlighted in blue; fat, the orange; and lean mass, the red areas. So here, for example, we can see your fat around the hips, thighs, waist and across the shoulders. We can see that you are carrying 793g and 808g

Cyclist heads to Bodyscan to be put through a DEXA scanning machine. The whole process takes less than five minutes, so can it really give us an accurate indication of our body fat percentage?


of fat in each arm respectively, 5,089g in your trunk and 2,481g and 2,630g of fat in each leg, so around 11kg in total.'

What that equates to is that I'm officially 16.2% body fat (not including my head). The remainder is 58,419g lean mass (muscle plus organs, tendons, ligaments and connective tissue) and a mere 3,138g for my entire skeleton. Seriously?

'People are often surprised by how light their skeleton is – the average for a man is between 2.5kg and 3.5kg, for a women 1.5–2.5kg,' says Chant. 'I had one guy tell me I surely must mean 31kg!'

Of course that's for a 'dry' skeleton – if you stripped me bare and weighed my skeleton the water, blood and marrow content would make it heavier – but I'm still blown away by the results, particularly the body fat content. Is too much information a depressing thing, even for the die-hard roadie?

Flatter to deceive

I've never considered myself particularly lean, especially for a cyclist, 



Scales are still part of the process. If we'd known this we wouldn't have worn those really heavy woollen shorts...

'Unless you are a skilled practitioner, then skinfold analysis – using callipers to measure the thickness of fat at certain sites around the body – can be next to useless'

"Mr Average" body types to derive its body fat percentages, which is no good for athletic people like cyclists.

'Hydrostatic weighing – using the Archimedes principle where you displace water in a tank – or DEXA scanning – yield far more accurate body fat percentage results.'

That explains the 4% disparity between what I thought I was and what I really am, but still I'm none the wiser: is 16.2% body fat for a 30-year-old male cyclist with racing aspirations a figure to embrace or one of disgrace?

'At the elite end 4-10% body fat is often considered an ideal range. A track rider might not mind being towards the higher end, but a road racer who tackles the hills will want to be as lean as possible,' says Kirkland. 'But within reason – being too lean can have implications on things such as the immune system, and every

person's physiology is different. So for some riders going below, say, 8% body fat can have a negative impact, but then others like Mr Wiggins, for example, can go very, very low for short periods of time for certain events.

'From a coaching perspective, then, I wouldn't be overly concerned with an accurately measured 16.2% body fat figure. Maybe I would be a bit if you wanted to podium at the national hill climb champs, but for a cat 1-4 racer, between 10-20% body fat for a male is a good average, or adjust that by 4-5% for a female. But I'm at pains to stress these are ranges, not targets. Each individual is different.'

To that end, Kirkland says neither he, nor most coaches, subscribes to a 'this is your ideal body fat percentage, now take steps to hit it', such is the complexity of the human body and the role of fat in it. And besides, the real proof of the pudding is performance on the bike. But he does add that 'if you were over 20% body fat – or 25% for a female – you'd probably stand to lose something, and for periods of not very intense training you're looking to lose no more than 0.8kg in weight per week.'

but I've had my body fat checked on a couple of occasions in the past using skinfold and bio-impedance techniques and I've always believed I was around 12.5%. Again, nothing to write to Dave Brailsford about, but I'd always thought I was doing OK, harbouring that slightly misguided notion that if I took my training and diet more seriously I could achieve top level brilliance. So to find out I'm 16.2% body fat is a bit of a shock. Have I been had? I put this question to British Cycling coach Andy Kirkland.

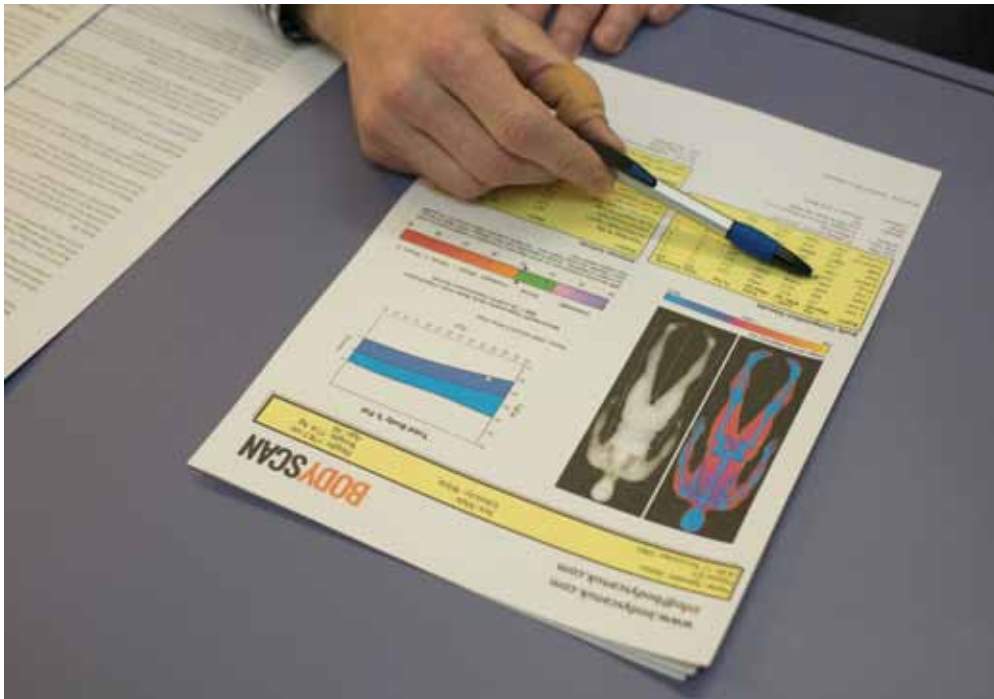
'Unless you're a skilled practitioner, for example ISAK certified [International Society for the Advancement of Kinanthropometry], skinfold analysis – using callipers to measure the thickness of fat at certain sites around the body – can be next to useless,' says Kirkland. 'So too bio-impedance, typically where you stand on some scales and a small electric current is passed through one foot and out the other; the change in resistance is reflective of body fat as there's different conductivity between lean tissue and fat. But it's susceptible to things like hydration [water retention greatly affects resistance] and uses predictive equations that are based on



Fat on the inside

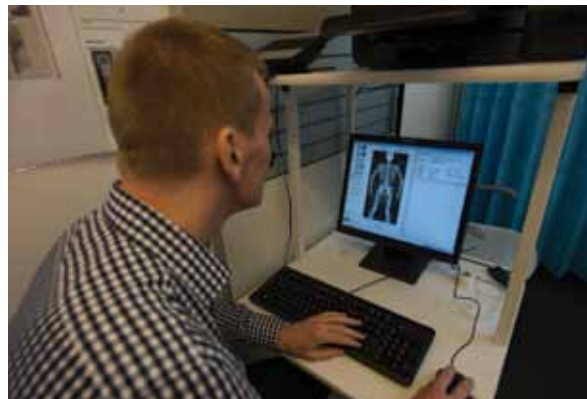
I'm now not feeling so bad – at 16.2% I'm a perfectly normal Mr Average in the grand cycling scheme of things – but there's still one thing that's bothering me: just where is all this fat? I can imagine what 11kg of butter looks like, but I'm struggling to imagine it stuck all over my body.

'We call it TOFI,' says Chant. 'Thin on the outside, fat on the inside. Essentially there are two main types of fat – subcutaneous fat, the inch you can pinch, and internal visceral fat, which does things like surround your organs. I had a guy in a while ago, 23, had the same body shape as you, weighed about the same but when he got the DEXA results he couldn't believe it. He was 30% body fat, so he had relatively high visceral fat. A lot of people delude themselves. For example, your visceral



fat here is 49.2cm squared. Under 100 is healthy, over 160 is high risk, as high visceral fat levels have been linked to things like type 2 diabetes. We had a taxi driver in, and he thought he just needed to lose a few kilos, but it turned out his visceral fat was over 200cm squared.'

Too much visceral fat can be bad, so should we be trying to limit fat all over? 'It needs to be understood in context,' says director of Guru Performance Laurent Bannock. 'If you're a rugby forward then you'll have a substantial amount of muscle mass, but being too lean can increase the risk of injury – a bit of fat can protect you from impact. Sumo wrestlers carry an awful lot of subcutaneous fat, but that's to their advantage, and when we've seen these guys they actually have very low visceral fat, and that's because of training and exercise.'



'Then if you're an endurance cyclist you'll likely want to be as lean as possible, and your muscle should be functional,' he adds. 'But even then, someone who's really ripped to the bone is carrying enough fat stores on them to power through at least five marathons.'

Top: DEXA software can analyse how your weight is distributed and where it comes from: fat, lean mass and bone. But it is most useful when charting changes over time, rather than quoting numbers in isolation

'Even someone who's really ripped to the bone is carrying enough fat stores on them to power through at least five marathons'

That's not to say that any one of us could go out and run at least five marathons, but it does rather cement the point, which is that ascertaining fat and determining whether it's useful is a tricky business that goes beyond a mere number. Yet common sense still dictates: 'For elite athletes there's a fine line between 1st and 5th. But on the more recreational side of racing, like sportives, there can be massive differences, and just losing a few kilos can have dramatic impacts on outcomes,' says Bannock. 'But losing weight doesn't tell you whether you're losing fat or lean mass, and to an athlete that's a critical difference.'

'Precisely,' echoes Chant. 'That's where DEXA comes in. We had a guy do a 12-week fitness programme, who got scanned at the start and the end. When he came back in the scales said he'd lost 6.5kg, but then the DEXA scan showed he'd lost 5.5kg of muscle and only a kilo of fat.'

So fat's a bit of a sticky subject. Not all fat percentages are created, stored, or employed equally, and there are no absolute golden figures to aim at. Yet having a DEXA scan or similar might well throw up some useful, objective warning flags – particularly where things like visceral fat are concerned – but for the most part in the sporting realm they exist as yardsticks or diagnostic tools in the broader training spectrum. Just how broad that spectrum is, or indeed how flexible it is, depends entirely on you.

'There's a balance between life and sport,' says Kirkland. 'I remember Wiggins once saying that if you were still a club-level cyclist at such and such an age, eat a pie and mash, and enjoy a beer with it. The implications on your performance won't be huge. In other words, are the lifestyle changes to go from 16% to 8% body fat actually worth it?' 🍷

Vitruvian man from the future

Science does Michelangelo, only better

For many years accessing a DEXA scanner meant getting involved in a research programme at a university or forking out tens of thousands of pounds to buy one yourself. But companies such as Bodyscan (bodyscanuk.com) now offer DEXA scans and consultations to the general public. Prices start from £129 for a scan and three-page report. The scans themselves are non-invasive and take just a few minutes, and the results are incredibly in-depth. Bone,

fat and lean mass is measured, and broken down into regions around the body and correlated against the NHANES test group of 20,000 similarly surveyed individuals to give an idea of how your results stack up against the world at large. As yet there aren't readily available control group charts by sport in the UK, but coaches such as Laurent Bannock (guruperformance.com) are on hand to help you interpret DEXA data in relation to your sport and your goals.

