



Should our DNA dictate our diet?

Megan Tatum

Genetics tests are taking off, with companies offering ‘bespoke’ nutritional advice based on nothing more than a swab of our DNA. Is it a crackpot craze or the future of eating?

I hate to say it, but you aren’t nearly as unique as you might think you are. Fifty per cent of your DNA is nigh-on identical to a banana. Ninety-six per cent to a chimp. And 99% to the person sitting next to you. Locked within that one per cent of uniqueness, though, is where things get interesting.

Held within the mind-boggling mass of the human genome might just be the answer to insatiable appetites, that dodgy feeling after bingeing on brie, or an inability to handle more than one cup of coffee. Or why some people pile on the pounds, while others remain sickeningly skinny.

That is the tempting claim made by a burgeoning number of firms. For a few hundred quid, they are offering to analyse our genetic individuality to determine what we should eat, and what we should avoid eating.

All you have to do is stick a swab under your tongue, send it off and receive a bespoke analysis of your own nutritional particularities, complete with recommended diet plan and advice on everything from caffeine, to salt, to whether or not we might need to go gluten free.

We tried it using a kit from DNA Fit (see box, p45) and it’s simple. Suspiciously so, in fact. So how does it work, and should we trust it?

“Everything about who we are is made up of the unique interaction between how we’re born, and what we do,” explains head of product at DNA Fit Andrew Steele. “The static part is our nature and that’s what makes us all different. We’re trying to shine a light on that and unlock that piece of data so people can make

better tweaks to their nutrition.”

DNA Fit charges between £99 and £249 to analyse a self-administered swab of DNA and assess it for about 35 genes connected to nutrition and diet. All are variants with a minor impact on function that can be effectively “cancelled out” by changes to lifestyle. The firm steers clear of sharing any genetic predispositions to serious diseases – even where these genes may also impact nutrition.

“We’re very keen on this ‘no bad news’ policy,” insists Steele. “We are not a medical company. We don’t want to be. We see ourselves at the other end of the spectrum of genetics.”

A non-medical company sharing this information would be plain “irresponsible” adds Bernie Williams, director of marketing and practitioner support at rival company My DNA Health, if it did so “without a proper medical practitioner involved or at least a genetic counsellor”.

So the majority of firms, though not all, limit results to identifying whether or not a client is lactose intolerant, whether they have a higher than average sensitivity to carbohydrates, or whether they need to top up on anti-oxidants among other, less sinister, genetic traits. Armed with this information, “it’s an opportunity to make better personalised nutrition or environment changes,” adds Steele.

Williams suffered from symptoms of “toxin overload” despite a healthy diet before her DNA profile uncovered a predisposed sensitivity to sulphur (she had been loading up on broccoli before discovering it wasn’t doing her any good). “Having this information and making

“Everything we are is made up of the unique interaction between how we’re born, and what we do”

small dietary changes meant all those symptoms disappeared. To me, that's powerful."

This approach holds increasing appeal. In a reaction against mass manufacturing, it seems the public is less inclined to accept the one-size-fits-all mantra within traditional nutrition. "Increasingly there is a belief we each have unique health needs," says Will Smith, commercial director at innovation consultants Happen UK. "Genetic tests advising on diet are the next step along the technology race to manage our health more precisely, more personally. They're making consumers feel like they have the tools to shortcut their route to a healthier self."

Personalised meals

The shift holds opportunity for food and drink producers, too. Already, brands are playing around with the possibilities of taste profiles matched to DNA, with the first DNA beer brewed up in November 2016 (see box, right), while in June DNA Fit partnered with Vita Mojo restaurants to create 'the world's most personalised restaurant menu'. Customers send off a swab and receive a bespoke meal prepared in five minutes and matching their 'individual macronutrient and ingredient needs'.

As the science progresses, the world of fmcg needs to ensure it's engaged, says Williams. "I hope in the future internal nutritionists working for major food companies are at least talking to companies like ourselves so they can get more education around this subject."

Tailored supplements, drinks and shakes are all

The world's first DNA brewed beer

Though many brands already tweak their product depending on where in the world it's being sold, tailoring the flavour profile to suit an individual's DNA is something new.

Meantime brewmaster Ciaran Giblin claimed to be the first brewer in history to brew a beer dictated by his individual DNA taste preferences in November 2016.

Using 'cutting-edge genetic profiling to map his propensity toward specific flavours', it was identified that Giblin was genetically inclined to enjoy bitter flavours.

The result was Double Helix, a 'bitter and hoppy double IPA with balanced bitterness from a variety of different American drinks' and 'tropical fruit aromas like pineapple and mango on the nose'.

And the verdict from Giblin? "If you want to make a beer you're going to love, you have to really mean it and go the extra mile – in this case, determine your genetically determined taste preferences first!"

possibilities, adds nutritional business consultant and British Dietetic Association (BDA) spokeswoman Mariëtte Abrahams. In time "people will be grouped into sub-categories by the way they metabolise nutrients with a sub-group of product tailored to them," she believes.

Bespoke diet plans, tailored protein shakes and hyper-targeted supplements laid out on supermarket shelves according to our unique subcategory of DNA. It all sounds too good to be true. That's because it is, says geneticist Dr Giles Yeo.

"While the genetic information is accurate because it's empirical, the interpretation, which incidentally is not regulated, is still in its embryonic stage and the people trying to make money from them are at the moment snake oil salesmen and charlatans," he says.

Yeo concedes that testing for the presence of single genes can throw up useful information (his own lactose intolerance was revealed when he tried his own DNA test) more complex combinations relating to weight management or our ability to handle nutrients "are just too complex at the moment" to hand out personalised recommendations, in his view.

Steele insists DNA has a "strict code of practice" that ensures every gene they provide data on comes from "multiple peer-reviewed human studies linking it" to that function. Similarly, Williams says My DNA Health uses a "rigorous scientific approach" using studies relevant to the population group, rather than "seven Japanese men, as that wouldn't be reliable," and selecting genes with "enough clinical evidence" available on their impact on health and how that can be managed by lifestyle changes.

But these "published, peer-reviewed papers refer to population-level risk and converting that to individual predictivity is very different," says Yeo. For example, data on the likelihood of women falling pregnant at certain ages across a population will not allow you to "pick a 34-year-old woman randomly off the street without looking into her and predicting whether or not she will become pregnant."

As a result, predictions based purely on DNA are "only slightly better than tossing a coin," says professor of genetics Tim Spector.

"Genes only explain a small fraction of the differences between people, usually less than 5%. For example, many people with the poor caffeine metabolising genes can still drink coffee."

Those wanting a look at their current nutritional needs would be better off sending in a "poo sample" for their gut microbes to be analysed, he adds. "There's much more variation in gut microbes than DNA, so it's much easier to tell a healthy from a sick gut by looking at the

microbes. You can't tell their state of health from DNA, or whether they're going to get some problem in 50 years. This is a more immediate readout of what's going on."

The difficulty in making these links between complex genetics and the nutrients your body needs is only compounded by the fact that these companies "are not taking into account your environment, which is notoriously difficult to measure" adds Yeo.

Both DNA Fit and My DNA Health refute this. Though DNA Fit only asks for age when customers send off their swab, it "endeavours" to always follow up with an expert consultation that can take account of lifestyle and environmental factors. To do so at an earlier stage would "make the reports incredibly complex", it says, and includes variables on which it wouldn't have "hard data". My DNA Health asks users to fill in nine health and wellness questionnaires alongside the DNA sample and supplies a "25-page lifestyle analysis report" prior to delivering the DNA results, says Williams.

Wild West

Anyway, you wouldn't look at the results of a blood test in isolation, adds Steele. DNA is no different. "It's only one part of the picture but it is a part of the picture and with it you can have a better personalised approach. There's a certain preconception about genetics that it's more than one part of the picture."

Yeo isn't convinced and insists his view isn't "controversial" within the scientific community either. "People are trying to make money from this when they are not able to provide anything you can buy at the moment."

And the fact remains this area, unlike medical genetics, remains largely unregulated – a problem accepted by the companies themselves. "Since we've started it's almost like a Wild West in direct consumer genetics," says Steele. "The challenge is 'how does a consumer know good genetic science versus bad genetic science?' so you almost have to self-regulate."

"We've tried to call for an industry-wide acceptance for a certain code of practice. It's all exciting stuff, and I believe it should be available without barriers, but it has to be done right. At the moment it's up to us and whoever is selling it to do it right."

But if they don't, what's the harm? Can advice to stock up on a bit more omega-3 really pose a danger? "It's the opposite that concerns me," says Yeo. "Say they predict you had a heightened ability to handle fat. Some people will take that to mean they can eat as much fat as they want. That's a problem because, no, you can't. That's when you could get into harm."

The science will get there, he insists. In the next 10 to 15 years, we could be making meaningful predictions off the back of information extracted by a swab. But companies "need to take a deep breath" and stop promising what they can't deliver.

Tempted by the allure of bespoke nutritional advice it's easy to imagine the warnings of experts might fall on deaf ears, however. In a world of Fitbits, meal planners and mobile apps measuring heartbeats, we're ravenous for any opportunity to make our health and nutrition more personalised.

And DNA-dictated diets? Well, you can't get much more personal than that.



Along with an in-depth report, DNA Fit provides a visual summary of your results

Me and my DNA Fit

What the hell does this mean? That's my first thought upon opening up a 25-page diet report delivered by DNA Fit. It's been only a week since I sent off my mouth swab for analysis along with name, age, and contact details and the results are in.

At first, I feel almost apprehensive. Will the test throw up something sinister? But then I get lost in talk of polymorphisms, alleles and enzymes that mean precious little to someone who ditched science at the first opportunity at school and decide to wait until I can get on the phone with an expert to make sense of it all.

A few days later I'm chatting with Andrew, a former Olympian and DNA Fit specialist and the truth is there's nothing scary in the information handed to me. If anything it's quite benign. "People sometimes want

genetics to be more than it is in a bizarre way," laughs Andrew. "There's a pop culture that frames genetics as a dystopian piece of information, reducing free will, but it's only another source of information to take into account."

And what I need to be taking into account is that bread is not my friend. I have a very high sensitivity to carbohydrates, he tells me, which mean my body absorbs more energy (read calories) from carb-heavy foods than the average person. In better news, I have a low sensitivity to saturated fat. That doesn't mean I should load up on butter, he cautions, but I can be a bit more flexible around the cheese board. All in all, my optimal diet to lose a few pounds is the low-carb plan included in my results.

I'm also one of only 18% of people that has a raised need for

omega-3, vitamin B, vitamin D and antioxidants. It sounds worrying, but can be easily addressed by a few dietary tweaks, according to Andrew. Oily fish two to three times per week, lots of dark leafy greens, a handful of Brazil nuts once per day for selenium and a vitamin D supplement.

A raised sensitivity to salt means either working out two or three times per week to sweat it out or giving up those lashings on my Friday night chips, and sadly I also lack the gene that could justifiably mean that red glass of wine is good for me.

It all sounds like sensible advice, and backed up by a DNA swab it's convincing, too. I'm not about to start overhauling my diet but a few healthy changes here and there sounds not unreasonable, even if the accuracy of the science is up for debate.

