



by Dr CHRIS VAN TULLEKEN



Picture: ALAMY

POSITANO is an Italian restaurant in the middle of Guildford run by a gregarious family of Italian culinary geniuses: not an obvious setting for a science experiment.

Food, wine and a vast Italian family might otherwise undermine the sober accumulation of data. Unless, that is, you want to film an experiment about pasta. Or, more specifically, why leftover pasta might be good for you.

That is what I was tasked with doing for the BBC, under the expert guidance of Dr Denise Robertson, a senior nutrition scientist from the University of Surrey. The subject of our experiment? Resistant starch.

It's hard to think of a less inspiring name for a food, so you can imagine my disappointment when the producers of the series *Trust Me, I'm A Doctor* said this was what I was going to investigate.

My co-presenters were flying to tropical locations, reporting on brain transplants and trying the latest aphrodisiacs, but I was off to Guildford to do an experiment about something that sounded only slightly more appealing than my other task for the programme: waxing my legs.

At least resistant starch wouldn't hurt, but I certainly had no expectation that it would change my eating habits.

I should also confess here that I'd never even heard of 'resistant starch' until then.

Like most people, I knew what starch was — it's what you get from foods such as bread and potatoes.

But, as Denise explained, the difference between normal and resistant starch could be significant when it comes to their effect on your body.

When the normal starch in white bread and pasta is digested, it's turned into sugar almost as fast as if you drank the same amount of sugar in a sweet drink.

This is because normal starch is made up of tangled chains of glucose sugar molecules that are broken down into single sugar molecules extremely easily in your gut, and then quickly absorbed. If this sugar isn't burned off, it is turned into fat.

The other problem with this sudden rise in blood sugar is that it causes a spike in your insulin levels — insulin is the hormone that mops up the sugar in your blood.

That spike in itself is probably bad for you, even if you're not overweight, as over many years the body can become less sensitive to insulin, so it works less well.

The spike can also mean your blood sugar levels drop, so that you end up hungrier than if you hadn't eaten anything at all; you may have noticed this effect after a sugary mid-morning biscuit break. These then are the dreaded 'empty calories', which have little nutritional value and don't make you feel full.

This is why pasta, along with other white, starchy food, has taken a beating over the past few years.

Don't throw out cold pasta - it could ward off

DIABETES

While some of the claims about the dangers are exaggerated, it is true that these foods do carry health risks and this is bad news for us Britons who won't think twice about double carbs for dinner: pizza and chips, beans and chips — a friend of mine even claims to enjoy 'potatoes and chips' (and she's a liver doctor).

The difference with resistant starch is that some of those glucose chains are no longer broken down in your small intestine (where food is normally broken down and the nutrients absorbed).

This means that glucose goes into your blood more slowly, your insulin levels don't rise so high and you feel fuller for longer.

But that's not all. The undigested starch goes into your large intestine, where you have around a kilo of bacteria; the resistant starch acts like fibre, and is fermented by these bugs. It's then turned into chemicals called short-chain fatty acids, which are

absorbed into your bloodstream and have a wide range of benefits, such as preventing heart disease and possibly lowering blood pressure.

One recent study showed that, in healthy volunteers, eating resistant starch could reduce some of the potentially harmful changes that eating red meat has on the gut.

Finally, of course, in acting like fibre, helps you poo.

AS DENISE explained all this about resistant starch, I started to wonder if, perhaps for the first time, I'd be able to use the word 'superfood' and mean it. This is where our restaurant experiment came in.

Resistant starch occurs naturally in lots of food such as bananas (but you've got to eat them while they're still a little green), in some beans and pulses, as well as raw oats.

However, cooking starchy foods, then cooling them, may also increase their resistant starch content. That's what our experiment would test.

In general, when you see science on TV it's a case of doing 'demonstrations' of experiments that have been done before.

But in *Trust Me, I'm A Doctor*, we try to run new experiments.

It's extremely stressful and complicated, but although this is an age of television fakery, everything you see in this series is totally authentic.

The plan was this: with the restaurant staff as the subjects for our experiment, we would feed them pasta that had been pre-cooked. But half the group would eat it cold and the other would have it reheated.

We'd then test them over the next few hours to see how their blood sugar levels responded to these different preparations. The next day, the groups would be reversed. In

order to do the experiment properly, each time they had to be starved for 12 hours first.

With the help of the head chef Ross (a bona-fide Italian, despite his name), we pre-cooked some imported dry penne and Ross covered it in a simple sauce of only tomatoes, garlic, salt and oil.

The reheated pasta was delicious, and bowls were emptied in seconds. But because of the experimental protocol, seconds were forbidden. This wasn't popular — one waiter claimed he would normally eat five times that amount for lunch.

WE were fairly confident the cold pasta would be more resistant than the stuff that had been reheated. Just as expected, the cold pasta gave less of a spike in blood glucose and insulin than freshly boiled pasta would.

But then we found something very unexpected; the pasta that had been boiled, cooled and then reheated had an even more dramatic effect.

Reheating the pasta seemed to make it even more resistant. This means less insulin, less blood glucose, less hunger and more fibre.

You might think that ten people isn't many, but the result was so consistent that Denise is confident that it's robust science.

She is going to continue her research — funded by Diabetes UK — which shows that, even without other dietary modifications, adding resistant starch to the diet can improve some of the blood results associated with diabetes.

Meanwhile after my initial scepticism, I've also become a real convert to the idea of resistant starch.

So how can you get this wonderfood into your diet?

Well, you can prepare pasta in this way, but it may be that freezing, then reheating many starchy foods could have the same effect — that is, freezing bread, pizza, and potatoes, then reheating them after cooking and

cooling, may all increase their resistant starch content.

Cooled roast potatoes are also a good source. (In the U.S. you can buy flours such as Hi-Maize that are produced specifically to have a high resistant starch content, but they're not available here.)

Resistant starch isn't going to end the age of obesity, but it looks like it will be a weapon in the arsenal. For most of us, to prevent weight gain or to lose weight we'll need to make a huge number of small changes, and this — eating heated-up leftovers — could be one of them.

We need more research into resistant starch done by scientists such as Denise Robertson, but she's going to need to get in touch with some PR people for a name change if it's going to take off.

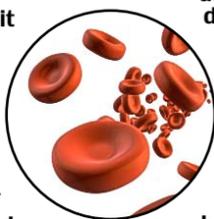
■ Dr VAN TULLEKEN is an infectious disease specialist at University College London. His research is funded by the Medical Research Council. *Trust Me, I'm A Doctor* is on BBC2 tomorrow at 8pm.

IT'S IN YOUR BLOOD...

YOUR blood group may increase heart attack risk.

YOU might have thought it was mainly down to lifestyle, but your chances of suffering a heart attack may also be linked to your blood group, according to new U.S. research.

Forty-four per cent of Britons have type O blood, 42 per cent are type A, 10 per cent type B and 4 per cent are AB. Each type is distinguished by its



antigens — immune defence systems — and has evolved to provide defences against lethal diseases.

But each has its weaknesses, too.

Scientists at Pennsylvania University found that people with a gene called *Adams7* have a significantly raised risk of heart attack.

However, people with this gene who also had blood group O had no raised risk.

DO I REALLY NEED

...a spray-on anti-perspirant that lasts seven days?

Odaban, £8.99, Boots.

THIS is aimed at people who sweat excessively, and can be used anywhere on the face or body.

The active ingredient, aluminium chloride (a more potent form of the aluminium found in many anti-perspirants), helps the product to last a long time.

The manufacturers say it combines with proteins in the skin to plug the pores, soaking up the sweat without blocking sweat glands. It has a pump spray with a metered dose to prevent over-application.

EXPERT VERDICT: Adam Friedmann,



consultant dermatologist at the Harley Street Dermatology Clinic in London, says: 'This did make my armpits feel quite dry. But you must put it on completely dry skin. Moisture can cause a bit of acid to form, which can sting — I hadn't read the instructions. I also added deodorant, as most people need a bit of fragrance to disguise smell.'

Whether it can really last seven days, he is unsure. 'I wash the area and reapply anti-perspirant every day, so it's hard to say. But if it does last that long, I don't see any harm in it. Hyperhidrosis — pathologically excessive sweating — is debilitating.'