- You will soon come to understand that it is not just a diet. It is much more than that: it is a sustainable strategy for a healthy, long life

- 'A little poison is good for you' is a colourful way of describing the theory of hormesis – the idea that when a human, or indeed any other creature, is exposed to a stress or toxin it can toughen them up. Hormesis is not just a variant of 'join the army and it will make a man of you'; it is now a well-accepted explanation in biology of how things operate at the cellular level.

- The fact that they taste bitter is a clear warning signal: keep away. So there are good evolutionary reasons why we should dislike and avoid bitter-tasting foods. Yet some of the vegetables that are particularly good for us, such as cabbage, cauliflower, broccoli and other members of the brassica family, are so bitter that even as adults many of us struggle to love them.

- Valter has been studying fasting for many years, and he is a keen adherent of it. He lives by his research and thrives on the sort of low-protein, high-vegetable diet that his grandparents enjoy in southern Italy. Perhaps not coincidentally, his grandparents live in a part of Italy that has an extraordinarily high concentration of long-lived people.

- Going without food for even quite short periods of time switches on a number of 'repair genes', which, as he explained, can confer long-term benefits. 'There is a lot of initial evidence to suggest that temporary periodic fasting can induce long-lasting changes that can be beneficial against ageing and diseases,' he told me. 'You take a person, you fast them, after 24 hours everything is revolutionised. And even if you took a cocktail of drugs, very potent drugs, you will never even get close to what fasting does. The beauty of fasting is that it's all co-ordinated.'

- Valter's work is focused on trying to figure out how you can go on driving as much as possible, and as fast as possible, while enjoying life. He thinks the answer is periodic fasting. Because one of the ways fasting works is by making your body reduce the amount of IGF-1 it produces.

- As well as reducing circulating levels of IGF-1, fasting also appears to switch on a number of repair genes.

- One of the things that calorie restriction does, for example, is to switch on a process called autophagy.4 Autophagy, meaning 'self eat', is a process by which the body breaks down and recycles old and tired cells; just as with a car, it is important to get rid of damaged or ageing parts if you are going to keep things in good working order.

- Valter's research points towards the fact that high levels of protein, the amounts found in a typical western diet, help keep IGF-1 levels high. I knew that there is protein in foods like meat and fish, but I was surprised that there is so much in milk. I used to like drinking a skinny latte most mornings. I had the illusion that because it is made with skimmed milk it is healthy. Unfortunately, though low in fat, a large latte comes in at around 11g of protein. And Valter recommends that you don't eat more than 0.8g of protein per kg of body weight per day. For someone like me, that would be around 64g a day.

- But why should the hippocampus grow in response to fasting? Mark points out that from an evolutionary perspective it makes sense. After all, the times when you need to be smart and on the ball are when there's not a lot of food lying around.

- Two months in I repeated the test and my performance had, indeed, improved. If you are interested in doing something similar then I suggest you go to www.cognitivefun.net/test/2. Do let us know how you get on.

- Mark Mattson believes that within a few weeks of starting a two-day-a-week fasting regime, BDNF levels will start to rise, suppressing anxiety and elevating mood.

- a pretty picture. One way to prevent the downward spiral into diabetes is to cut back on the carbohydrates and instead start eating more vegetables and fat, since these foods do not lead to such big spikes in blood glucose. Nor do they have such a dramatic effect on insulin levels. The other way is to try Intermittent Fasting.

- To calculate your BMI, go to a website such as www.nhs. uk/tools/pages/healthyweightcalculator.aspx. This will not only do the calculation, but also tell you what it means. One criticism of BMI is that someone who has a lot of muscle could get a high BMI score. This is not an issue for most of us. Sadly.

- Male or female, your waist should be less than half your height.

- A definition of optimism is someone who steps on the scale, while holding their breath. You are fooling no one.

- You should be able to get standard tests on the NHS. Fasting glucose. I chose to measure my fasting glucose because it is a really important measure of fitness, even if you are not at risk of diabetes, and a predictor of future health. Studies show that even moderately elevated levels of blood glucose are associated with increased risk of heart disease, stroke and long-term cognitive problems. Ideally I would have had my insulin sensitivity measured, but that test is complex and expensive. Cholesterol. They measure two types of cholesterol: LDL (low-density lipoprotein) and HDL (high-density lipoprotein). Broadly speaking, LDL carries cholesterol into the wall of your arteries while HDL carries it away. It is good to have a lowish LDL and a highish HDL. One way you can express this is as a percentage: HDL to HDL + LDL. Anything over 20% is good. Triglycerides. These are a type of fat that is found in blood; they are one of the ways that the body stores calories. High levels are associated with increased risk of heart disease. IGF-1. This is an expensive test and not available on the NHS. It is a measure of cell turnover and therefore of cancer risk. It may also be a marker for biological ageing. I wanted to find out the effects of 5:2 fasting on my IGF-1. I had discovered that IGF-1 levels drop dramatically in response to a four-day fast, but after a month of normal eating they bounced right back to where they had been before.

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- The reason our bodies respond to fasting in this way is that we evolved at a time when feast and famine were the norm. Our bodies are designed to respond to stresses and shocks; it makes them healthier, tougher. The scientific term is hormesis – that which does not kill you makes you stronger.

- The benefits of fasting include: Weight loss A reduction of IGF-1, which means that you are reducing your risk of a number of age-related diseases, such as cancer The switching-on of countless repair genes in response to this stressor Giving your pancreas a rest, which will boost the effectiveness of the insulin it produces in response to elevated blood glucose. Increased insulin sensitivity will reduce your risk of obesity, diabetes, heart disease and cognitive decline An overall enhancement in your mood and sense of wellbeing. This may be a consequence of your brain producing increased levels of neurotrophic factor, which will hopefully make you more cheerful, which in turn should make fasting more doable

- Spend your calories wisely – the Menu Plans on pages 139-161 will be useful – but it's also worth having a clear idea of favourite fast-day foods that work for you. Remember to embrace variety: differing textures, punchy flavours, colour and crunch. Together, these things will keep your mouth entertained and stop it frowning at the hardship of it all.

- Your aim is to have food that makes you feel satisfied, but stays firmly within the 500/600 calorie allowance – and the best options to achieve this are foods that are high in protein, and foods with a low glycaemic index (GI).

- for 'good protein'. Steamed white fish, for example, is low in saturated fats and rich in minerals. Choose skinless chicken over red meat; try low-fat dairy products over endless lattes; include prawns, tuna, tofu and other plant proteins. Nuts, seeds, pulses and legumes are full of fibre and act as bulking agents on a hungry day. Nuts – though high in calories (depending, of course, on how many you eat) – are generally low GI and brilliantly satiating. They are fatty too, so you might imagine they are 'bad for you', yet the evidence is that nut consumers have lower rates of heart disease and diabetes than nut abstainers.20

- Eggs, meanwhile, are low in saturated fat and full of nutritional value; they won't adversely affect your cholesterol levels and they score a mere 85 calories each, so an egg-based breakfast on a fast day makes perfect sense. Two eggs plus a 50g serving of smoked salmon clocks in at a sensible 250 calories.

- For more suggestions about foods to keep you full and fit on a fast day, and the benefits certain choices will bring, turn to page 107-8.

- In one Belgian study, men asked to eat a high-fat diet and exercise before breakfast on an empty stomach put on far less weight than a similar group of men on an identical diet who exercised after breakfast.

- Know your weight, your BMI and your waist size from the get-go.

- BMI is your weight (in kilograms) divided by your height (in metres) squared; it may sound like a palaver, and an abstract one at that, but it's a widely accepted tool for plotting a path to healthy weight loss. Do note that a BMI score takes no account of body type, age or

ethnicity, so should be greeted with informed caution. Still, if you need a number, this is a useful one.

- Make a plan. Write it down. Plenty of people recommend keeping a diet diary. Alongside the numbers, add your experiences; try to note down three good things that happen on each day. It's a feel-good message that you can refer to as time goes by.

- Prep your fast-day food in advance so that you don't go foraging and come across a leftover sausage lurking irresistibly in the fridge.

- 'We humans are always looking for things to do between meals,' said Leonard Cohen.

- A psychological mechanism called 'habituation' – in which the more people have of something, the less value they attach to it – means that doing the opposite and trying to suppress thoughts

- Check the GI count of your chosen fast-day foods online. Diabetes UK has an excellent guide at www.diabetes.org.uk.

- GI Index from the University of Sydney on www.glycemicindex.com,

- In fact – and this is worth noting if you are aiming for optimal fitness – training while fasting can result in better metabolic adaptations43 (which means enhanced performance over time), improved muscle protein synthesis,44 and a higher anabolic response to post-exercise feeding.45, 46 Training on an empty stomach turns out to be beneficial on multiple levels, coaxing the body to burn a greater percentage of fat for fuel instead of relying on recently consumed carbs; if you're burning fat, don't forget: you're not storing it. As we've seen, one recent study found that working out before breakfast is beneficial for metabolic performance and weight loss.47 A report in The New York Times suggests that it even 'blunts the deleterious effects of over-indulging' – making fasted exercise a canny way of 'combating Christmas'.48 According to the study's authors, 'Our current data indicate that exercise training in the fasted state is more effective than exercise in the carbohydrate-fed state.' Certainly food for thought. Do not, however, increase your fast-day food allowance to 'compensate' for calories burned through exercise: on a fast day, stick to 500 or 600 calories, whatever level of activity you choose. That's where the benefits lie.

- Michelle Harvie and Professor Tony Howell, who work at the Genesis Breast Cancer Prevention Centre in Manchester, have done a great deal of fascinating work developing and testing different forms of two-day intermittent energy restriction.

- FAST 600 MENU PLANS FOR MEN