

SUNDAY TIMES
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JENKINSON

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struggling with weight issues'

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Downsizing



HOW TO EAT

(and Still Lose Weight)

NEW CHAPTER:
The Ups and Downs
(and Ups Again)
of Weight Loss
Drugs

The Science to Surviving
Our Ultra-Processed
Food Environment

How to Eat (and Still Lose Weight)

Dr Andrew Jenkinson is a consultant surgeon and part of an expert team developing advances in both the medical and surgical treatment of obesity at University College Hospital in Bloomsbury, central London. He is the author of the *Sunday Times* bestseller *Why We Eat (Too Much)*.

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How to Eat (and Still Lose Weight)

*The Science to Surviving Our Ultra-Processed
Food Environment*

DR ANDREW JENKINSON



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This book is based on my own experience as a consultant surgeon with a special interest in advanced laparoscopic, or keyhole, surgery. In order to protect the privacy and confidence of patients, I have, of course, not used any real names and I have changed all physical descriptions and other features to ensure that no one is identifiable. I have, in some cases, also changed genders and racial origins. This is because this is not a book about the individuals I have described, but about what we can learn from them

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Contents

<i>Prologue</i>	I
<i>Introduction</i>	5
PART 1 – BODY: HOW WE ADJUST TO MODERN FOOD	
1. Diet School: Understanding Weight Control	15
2. The Modern Kitchen: Understanding Our Eating Environment	44
3. The Ultras: What Is Inside Ultra-Processed Foods and How Do They Affect Our Health?	72
4. It's Not the Calories in the Food, It's the Food in the Calories: Explaining the Weight-Gain Signals in Food	87
5. Plant Medicine	105
6. On Exercise	116
PART 2 – MIND: HOW OUR BRAINS HANDLE MODERN FOOD	
7. Who Are You?: Understanding Unconscious Behaviour – Habits and Reward	131
8. Beware of Your Surroundings: How Our Environment Makes Us Who We Are	150

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Contents

PART 3 – BALANCE: HOW TO CHANGE YOUR HABITS AND IMPROVE YOUR HEALTH

9. Change and Control	163
10. Cookery School	195
11. Last Orders: Why Food Matters	221
12. Global Kitchen	227
 BONUS CHAPTER	
13. The Ups and Downs (and Ups Again) of Weight-Loss Drugs	251
 <i>Appendix</i>	 269
<i>Acknowledgements</i>	279
<i>Index</i>	281

For Dad, my Superhero

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Prologue

The New Fuel

Imagine that a New Fuel has been developed that can be used instead of petrol in your car. The New Fuel is much cheaper than petrol and seems to work just as well. The day-to-day performance of your car appears unaffected. The only issue is that the New Fuel doesn't last for as long as petrol, but despite the need to refuel more frequently it is still much more cost-effective per mile. The New Fuel immediately becomes popular.

Because the New Fuel is so cheap, the producers are able to offer an additional reward to buyers. A small gift that makes the car owner happy is provided at the pump every time they fill up. Clever advertising by the New Fuel companies also suggests other benefits of using it. The advertising works, and New Fuel users feel good when they fill up their cars.

As well as giving you a satisfying feeling when you refuel, the advertising campaigns start to make it feel normal to fill up more frequently. Billboards and TV ads appear of happy, beautiful people going to New Fuel stations daily, and feeling great when they do this, changing the behaviour of car drivers. It is no longer considered normal to fill up with petrol every week or so; instead the required daily refill of the cheap New Fuel becomes normal behaviour. To make things easier, New Fuel stations become available every few miles . . . and your gas tank can be filled up in a matter of seconds through modern high-pressure pumps.

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Some companies offer to adapt your car so that it can hold much more of the New Fuel. Larger gas tanks are added to the outsides of cars, bulking up the doors and trunks. Although this makes driving more hazardous and slow, it catches on. Within a few years, a third of the cars on the road have been adapted so that they dwarf standard cars.

And so a whole industry around the New Fuel emerges, encouraging its use, reassuring us that it is safe, changing our refuelling behaviour and adapting our cars to have massive fuel tanks.

But if you looked under the bonnet of your car and really examined its inner workings, you would realize that it was never really designed to run on the New Fuel. You would see that the New Fuel damages the engine, meaning it is less powerful (and needs even more New Fuel to perform). The fuel seeps out of the tanks into the body of the car, accelerating corrosion and rust, and ageing the car prematurely. It interferes with the electronics, meaning the massive storage tanks always appear nearly empty on the fuel gauge. After a few years of use, the engine splutters and behaves erratically. The massive new fuel tanks make the car unstable and unsafe to drive. It dies early.

The New Foods

Just like cars, humans need fuel to survive and move. Fuel in the form of food. Over the last few decades, new types of human foods have emerged. Processed foods – made up primarily of sugar, refined carbohydrates (such as wheat), vegetable oils, and artificial flavourings and colourings – now dominate the nutritional options available to us. These foods are mass-produced in factories, marketed aggressively and packaged colourfully. They

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Prologue

are addictive to humans and highly profitable for the food industry. They appear, over the short term, to be safe – our bodies can easily run on them. And just like in the New Fuel story above, these New Foods are cheap, they make us feel good, and we are encouraged by advertising to eat them more frequently. But just like in the car analogy, the New Foods cause major dysfunction in how our bodies work.

This book will lift the lid on our own human bonnet, explaining how the tasty, addictive New Foods around us disrupt our bodies and our minds. We'll learn how we are not designed to run on them, and how they cause our bodies to misfire and our brains to miscalculate. They make us feel unnaturally good but force many of us to need extra fuel stores (in the form of fat); and for others they cause oxidative corrosion and modern Western diseases . . . In other words, they make us die early.

Once you understand this, you will want to eat – in fact you will crave – the foods we are designed to run on. You will not want to consume the New Foods. The mental shift in your understanding of how your body uses fuel means that minimal willpower will be needed to change. You will finally understand how your own body – your own personal engine – works.

In this book I'll show you how to choose healthier foods and offer tips and techniques for incorporating them into your diet, helping you to lose weight in the process, if that is your goal. With these powerful insights in hand, your body will revert to the wonderful machine it was made to be . . .

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Introduction

'If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle.'

Sun Tzu, *The Art of War*

Ain Al Khaleej Hospital, Al Ain, UAE, January 2022

We were basking in the evening sun, sitting together on a bench outside the main entrance, taking a break from a long clinic. The hospital had a curious space-age design. It looked like a giant cylindrical UFO that had just landed. Around it were immaculate lawns that abutted neatly painted zebra kerbstones. A vividly colourful flower-bedded roundabout stood next to the main entrance, welcoming incoming 4x4s and luxury cars. In and out of the sliding doors wandered Emirati men, clad head to toe in white robes, and their wives, fully covered in black burqas.

Since early morning we had been visited by patient after patient after patient – a long line of people who sensed they had lost control of their weight and were becoming sicker and sadder because of it. With the help of Samer, my Jordanian friend and Arabic translator, we had explained, again and again, the most effective ways to lose weight. Either by changing diet, injection treatment or weight-loss surgery (like gastric bypass).

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Samer took a sip of his strong Turkish coffee and said something astonishing to me. ‘Do you know, Dr Andrew, that I too used to suffer with obesity. I weighed 125kg [around 20 stone].’ He then proceeded to describe to me exactly how he was able to turn his situation around. How, by understanding how his body, and just as importantly, how his mind worked, he had been able to devise a way to sustain his weight loss for the past ten years.

Samer now weighed 70kg (11 stone) and looked great – tanned, happy and healthy. Every day he dressed in a different dapper suit that showed off his tall, slim frame. His inquisitive outlook on life and his attitude towards his journey through extreme weight gain and then weight loss was compelling. The basis of his success was very similar to the advice I give patients, outlined in my first book, *Why We Eat (Too Much): The New Science of Appetite*. But he had never read the book; instead he had worked out how to reset his weight through years of trying. He achieved the same weight loss that would be expected after bariatric surgery, the operations we had been describing to our Emirati patients all day . . . but he had never undergone this surgery.

Sensing my enthusiasm for his story, Samer charted his weight-gain journey in more detail. When he was younger he had lived in Jordan, in a time before much junk food was available. In his early twenties he would work during the day, then play football in the streets in the evening, before coming home at dusk to fill himself up with tasty grilled meats and fish, rice and flatbread, yogurt and tabbouleh, finishing off with coffee and fresh fruit. At sunrise he would wake up to strong Arabic tea and dates.

Aged twenty-six, he relocated to the United Arab Emirates, taking a job as a chief operating theatre technician in a pristine new hospital. His whole lifestyle changed. The UAE is hot like a furnace in the summer, and so people tend to stay in their

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air-conditioned apartments. For Samer there was no football, and no home-prepared food to come back to in the evening. At first he loved the new foods available to him – fast foods that tasted so good, sweet snacks that made him feel great and deflected his loneliness. He got into the habit of ordering fast-food deliveries in the evening. And then the Netflix revolution came about and he spent most evenings binge-watching his latest favourite TV show while mindlessly eating snacks. His weight went from 80kg, to 90, to 100, to 115, before settling at 125kg.

Over the next ten years, he dieted. He tried all the latest fad diets, starved himself, and exercised. His weight yo-yoed up and down by 10–12kg during this time, but the excess pounds always came back. As Samer said of one particular diet he'd tried, 'Keto was like breathing in and out of a balloon; the weight goes down and up, down and up.'

One morning he was listening to a local Arabic radio station and they were discussing the health benefits of taking a drink of hot water with fresh lemon juice on waking, and not eating for a full hour afterwards. His interest was piqued, as his colleague at work had told him just that week that this remedy had helped kick-start significant weight loss by helping 'melt away' the fat. He tried it and some weight came off.* He had finally started to nourish himself and become aware of his body.

Inspired by this small victory, Samer decided to address his late-night snack habit. But it proved difficult to just give up this ingrained behaviour, so instead of cutting out his evening snack, he switched from sweets and crisps to preparing a board of sliced carrots, cucumbers and finely chopped raw cabbage

* It would have had great antioxidant effects and also increased his period of fasting, making him feel better in himself and stimulating some weight loss.

with a sprinkle of salt. After two months of doing this he noticed further weight loss. Eventually he was able to stop snacking in the evening entirely and decided to get early nights to give his body time to rest and repair itself. Some further weight loss followed, but then he hit a plateau of 105kg.

His next move was the most difficult. He correctly reasoned that sugar was not good for his metabolism and decided to avoid it completely. 'Losing weight is like a war,' he told me. 'You will win it with strategy and being clever and understanding the body.' He smiled. 'When I gave up sugar my friends laughed at me and tempted me with treats – I wanted to cry, I wanted to hit my head against a wall, but after forty days the addiction was gone. It became easy. If you stop sugar for forty days you will never want it again. But it takes a strong mind to do this.'

Samer's weight hit 90kg but again plateaued. He realized that exercise was not shifting his weight. 'Two hours on the treadmill is the same as one Coca-Cola. It's not for weight loss but is good to keep the muscles tight.'

One of the rules that he came to like was his theory that 'if it tastes too good it will probably harm the body, but if it tastes natural it is good for you'. He became mindful of the tastes of different foods and began to crave natural foods and dislike processed food. 'If a fast-food burger was in front of me and it was the last thing on earth to eat, I would leave it.' He gave up white rice, sensing that it was too heavy, and exchanged it for bulgur wheat which he found 'lighter on the stomach'. He started to consume just two meals per day of fresh foods, and would not eat for the two hours before bed. 'Each meal you should not eat so much that you want to sleep,' he said.

Even though he was aware that vigorous exercise was not a long-term weight-loss solution, he was aware of the benefits of moderate exercise, which he believed 'wakes up the body and is

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good for the metabolism, even a walk'. He said you should try to 'reach an addiction that is opposite to bad food – not just eating good food but craving restful sleep and savouring exercise'.

His weight came down to 80kg and stayed like this for several months. Then, over a matter of weeks, without any further changes to his diet, he lost more weight as his body finally adapted to his new lifestyle, settling at 70kg. Over the past ten years he had successfully maintained a healthy weight of between 70 and 75kg.

What intrigued me most was that the successful changes that he had made in his lifestyle and diet only came about after a shift in his mentality – the way he thought about food and his health. After years of trial and error, years of failed diets, Samer had come to understand that the most important battle to win was the one in the mind. His weight-loss success was not based on an unusually iron willpower (although he had needed some willpower initially to give up sugar); it was based on a change in his outlook and understanding of food. He did not feel as if he was giving anything up; he felt no loss for the foods he had eaten before. He craved healthy food now, and was turned off by the taste and the feeling that unhealthy foods gave him. 'You need to become addicted to healthy foods, just like you were addicted before to junk food. Your mind and your body will thank you for it.'

Samer continued with gems of dietary advice every time we met. It seemed he had reached a new way of living; he had changed as a person and his body had changed with him. At first it had taken some self-discipline, but eventually it became easy for him. 'Weight loss is like learning to play the guitar,' he said. 'The more you practise, the better you will get at it. You should not be disheartened when things don't always go to plan.'

My discussions with Samer inspired me to write this book.

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Once you clearly understand how the toxic food environment surrounding you affects your body and your mind, it becomes much easier to lose weight *and* keep that weight off for good. It's easier to sustain weight loss if you truly understand how your mind and your body react to unhealthy foods. How these addictive foods can influence your metabolism, your appetite, your behaviour and your habits. How these habits can be hard to break. In *How to Eat*, alongside a new understanding of how we function (or malfunction) in our current environment, I will provide a tactical rulebook to follow that clearly outlines how to make healthy changes to your lifestyle that will stick.

Many people who read my last book, *Why We Eat (Too Much)*, were full of praise for how it changed their lives; it was a tool to help them adjust their weight to a healthier level over the long term. I received hundreds of messages from people who were able to implement the book's ideas in their daily lives and to lose a considerable amount of weight (and keep it off). 'Pretty mind blowing', 'should be on medical students' syllabus' and 'the Rosetta Stone of modern human health!' were just some of the reviews posted on Amazon. However, other people tried their best to follow the guidance but found themselves dragged back to old behaviours. *Why We Eat* described the relationship between our food and our bodies, but not how our brains work to constantly seek the easy, familiar, pleasurable path, often to the detriment of our health. *How to Eat* will unpack the new, vitally important science of the brain and the body, showing you how to harness your body and reprogramme your mind to lose weight for good.

Since *Why We Eat* was published, scientists have made great strides in understanding how the brain makes decisions, including how reward pathways are etched permanently into our brains and how these pathways lead to habitual and mindless

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behaviours. We have also learned how behaviours are triggered by cues or reminders that if we take such an action we will get a reward, generating a pleasant feeling in us. An example of this, outside of the food-health area, is our growing use of smartphones. These devices are designed to trigger a little feeling of pleasure (a dopamine hit) whenever a nice message or a funny video comes up. Hence many (probably most) people are constantly checking their phones to see if that message or video is there. I am increasingly amazed that if you look at a group of people in a public place, most of them will be gazing at their phones, looking for that pleasure trigger. Sometimes I too find myself gazing at the phone screen, almost like a zombie, in my habit loop. In this book, we will examine how processed foods can trigger those same pleasure-centres, and how they can cause unhealthy habits to form. We will learn how our habit loops are exploited by the food industry for its profit, with unfortunate consequences for our health and wellbeing.

How to Eat (and Still Lose Weight) will explore and explain how our decision-making works, how unhealthy habitual behaviours form, and more importantly how to replace them with healthier behaviours. We will delve into addictions – how to recognize them and how to overcome them. One of the important areas in this field is the trigger – the cue or reminder – in our environment that makes our brain crave a certain reward and follow a certain action. We will examine how food companies are not only experts in making foods that act like drugs, giving us a temporary high, but also able to create the trigger (or trap) in the first place, through well-placed adverts and clever marketing. By understanding these traps for what they are, and why they are placed – as well as the health consequences of falling into them – we will be much better prepared to cope with the constant bombardment of temptation. This

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knowledge will promote a new outlook and understanding – a form of identity change that will cause a natural desire for a healthier eating pattern. It will give you the tools to create that aversion to modern foods that my friend Samer described, so that no willpower is needed to change.

The book also covers *how* to change once you have this knowledge: how to change unhealthy habits, how to cope with cravings, and how to relax without resorting to food or drugs. It will make clear what foods to try to avoid and what foods to savour. Hopefully, by this time, your understanding of food will make this easy.

A common theme of the feedback from my first book was that it was not prescriptive enough. Many readers wanted more specific examples of meals and meal plans. In the final chapter, Global Kitchen, chefs have helped me to identify some wonderfully nutritious breakfast, lunch and dinner ideas from around the world to provide a great new variety of choices for you.

Finally, I would like to emphasize that this is not purely a book about weight. We know modern foods not only cause obesity (in about a quarter of the population), they are also the cause of many diseases not commonly seen in the areas of the world that have maintained their traditional food culture. Many autoimmune diseases, inflammatory conditions and allergies are directly caused by our modern food environment. By changing the way you eat and live, you will be protecting yourself against these conditions.

As Sun Tzu wrote in *The Art of War*, if you know your enemy and yourself, you need not fear the result of a hundred battles. Once you have read this book, you will know how your body and your mind work, and you will understand exactly how modern food and the modern food environment affect you. You should not fear, or doubt, the outcome.

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PART I

Body

How We Adjust to Modern Food

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CHAPTER I

Diet School

Understanding Weight Control

*Operating Theatre 10, University College London
Hospital, January 2023*

Mr Johnson weighed around 150kg (23½ stone). He had informed me that he had always been on the big side but just could not lose weight when he carried out the instructions of the numerous dieticians, nutritionists, fitness instructors and life coaches he had seen in the past. He had recently developed diabetes and had decided to seek a referral to my bariatric surgery unit at University College London Hospital. His semi-naked body was now being carefully prepared for that surgery.

Every muscle in his body had been paralysed by an injection of curare, the same ancient plant poison used by Amazonian hunters in their blow darts. Because of his paralysis, he couldn't breathe now and so was connected to the breathing machine via a throat tube, its bellows providing a reassuring sound to my friend Wint, our anaesthetist. She had administered a form of hypnotic (the same compound found in so-called date rape drugs) so that all memory of this event would be erased. She had topped him up with a hefty shot of morphine in anticipation of the pain to come.

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He was lying flat on the operating table with his arms outstretched and legs apart, almost as if mid-star jump. I was reminded of Leonardo da Vinci's famous *Vitruvian Man* sketch, but this time with a very large modern-day individual. As the theatre staff secured the patient's arms and legs to the table extensions with soft crêpe bandages, I stood between his legs and took the operating-table remote control, pressing the 'Reverse Trendelenburg' button. The table whirled and Mr Johnson was elevated to a 45-degree angle, his body robotically rotating to face towards me. A large TV monitor attached to a hinged metal arm was swung down to a comfortable viewing position just below my eyeline and about a metre away from me.

Lise, our senior scrub nurse, wheeled in a trolley laden with surgical blades, clips, tubes and wires, to rest next to Mr Johnson's body, and she proceeded to apply bright orange skin-disinfectant to his rotund abdomen. The surgical lights came on, brightly illuminating the whole area, and green sterile drapes were positioned around Mr Johnson's body and legs so that the only skin visible was the orange luminescent square of his abdomen. It was time for theatre, time to perform, to concentrate and operate. I went to the scrub sink to get clean.

Gowned, gloved and masked, everything was set. I stood between Mr Johnson's legs, holding a razor-sharp surgical blade next to his abdominal skin. 'Is it OK to start, Wint?' I asked. At her nod, the gleaming blade sliced a 12mm (half-inch) cut through his skin and he bled healthy bright red blood. 'Trocár, please.' Lise handed me a see-through plastic tube with a pointed end, almost like a blunt pencil point. I placed a thin surgical telescope (the instrument relaying the images of the surgery, via a digital camera, to the TV monitor) into the plastic tube and aimed the pencil point through the bleeding cut I had made in Mr Johnson's abdomen. I looked at the TV

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monitor and could see that we were at the level of the yellow fat under his skin. At this stage I proceeded to carefully stab Mr Johnson all the way through his abdominal wall with the pencil-like implement, putting my weight into it, twisting and forcing its sharp point deep into him. If he hadn't signed the consent form agreeing for me to do this to him, it would have been a criminal assault. But as it was, the stabbing was agreed, and controlled, and each layer of his abdominal wall – fat–fascia–muscle–fat – was visible to me on the screen as the trocar slipped safely into his abdomen.

The procedure I was about to perform would be life-changing for Mr Johnson. A year from this day, after I surgically removed most of his stomach, he would weigh around 90kg (just over 14 stone), his diabetes would have disappeared, he would not feel hungry or crave bad food, and his self-esteem and quality of life would be immeasurably improved.

I made four more small cuts into his skin and stabbed four more pencil-point trocars through his abdominal wall. Through one of the trocars, a tube pumping carbon dioxide gas into the abdomen was placed. As the gas entered Mr Johnson's abdominal cavity, his abdomen ballooned on the outside to resemble a full-term pregnancy, and on the inside the gas created the space to vividly see his organs and to perform the operation. Then the surgical lights were turned off and the operating theatre became like a dark movie theatre; the crisp digital HD images of Mr Johnson's insides gleamed on TV monitors throughout the room, and a hush descended, the only sound the beep-beep-beep of the heart monitor.

We had an audience today – two young medical students who had been watching the whole process since Mr Johnson was wheeled into theatre. It was half a lifetime since I had been in their position, but I knew they were excited and scared at the

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same time. I wanted to make sure they remembered and learned from their experience. I started by pointing the camera at Mr Johnson's purple and engorged liver. 'Twenty per cent of obese people have this type of liver. It's due to too much fat and sugar storage and can cause inflammation, and liver cirrhosis in the future.' I swung the camera to point out the omentum – the glistening and inflamed yellow fat hanging like an apron from the large bowel – as well as the dusky spleen throbbing away like a potential vascular explosion, and his vast pink stomach.

'This operation is called a sleeve gastrectomy,' I told the students. 'Basically, we are going to remove around two-thirds to three-quarters of his stomach.' They were staring at the TV monitor as I indicated the sizeable part of the stomach that was going to be removed. 'The stomach will be reduced in capacity from the size of a Galia melon to the size of a banana,* going from a 2-litre capacity to around 200 to 300cc . . . but the question I want to ask you is why is this man having this surgery in the first place? Why can't he just go on a diet and move more?'

'Maybe he tried but lacked the willpower to lose weight on a diet,' one replied. 'Could it be that he has a food addiction?' the other answered.

* Doctors often describe the size of a lump, cyst or organ by comparing it to the size of a fruit – grape, plum, tangerine, orange and melon being common examples. Very occasionally a sporty surgeon will use sports balls as a comparison; golf ball, tennis ball, etc. 'His hernia is the size of a . . . tangerine / tennis ball / grapefruit / rugby ball [delete as appropriate].'

Leptin – The Fat Hormone

‘Haven’t they taught you anything about *leptin* in medical school yet?’ I enquired. After a long pause, one of the students replied, ‘Oh yes, we had a lecture which mentioned it. I think it comes from fat cells and influences appetite, but that’s all we were told.’ I silently shook my head – still the medical schools were not explaining obesity to their students.

I started to dissect the outer edge of Mr Johnson’s stomach away from its fat and blood vessels using a harmonic coagulator, an instrument whose pincers rub the tissues grasped between them at 55,000 times per second, causing heat, thermal injury and good coagulation, stopping any blood vessels in its jaws from bleeding. As the tissues were cleanly cut, smoke from the vaporizing fat started to cloud the view, so I opened the smoke-extractor valve.

‘Well, leptin is the *master controller* of our weight, and when it stops working properly people lose control of their weight no matter what they try and do about it. Leptin is a hormone that comes from fat, and the more fat someone has, the higher the leptin level in the blood.’ I grasped Mr Johnson’s abdominal belly fat between my finger and thumb to demonstrate. ‘This man has a lot of fat and so will have a lot of leptin in his system. But leptin is the hormone that is supposed to stop people getting too fat, or too thin. The amount of leptin in the blood acts as a signal to the part of the brain that controls our weight called the *hypothalamus*. The hypothalamus controls how hungry or full we feel. You know that feeling after you’ve finished a large meal? The feeling of fullness you still feel three hours after you have finished eating, even when the stomach is empty? That full feeling comes from your hypothalamus. What about that feeling

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when you have been so busy that you didn't eat all day, and then in the evening you are so hungry, you will eat anything? That feeling, that signal to act and to eat, comes from our hypothalamus. Hormones are very good at reminding us what to do.

'So, when things are working normally, your hypothalamus will be able to sense if you have put some weight on. It will sense the increase in the leptin level in the blood and will respond by increasing feelings of fullness, and decrease your appetite. The response is that you naturally eat less and you seamlessly lose the weight that you had gained, until your leptin level returns to normal. Leptin is just the signal to your brain telling it how much fat you have stored – how much energy is available in the future. It acts like the fuel gauge on your car dashboard. When the gauge is full, you have no interest in filling up, but once the gauge dips towards empty you will be looking to fill the tank back up.'

The Broken Gas Tank Meter – Leptin Resistance

'So, if leptin is so good at suppressing appetite and controlling your weight, what has happened to this signal in Mr Johnson? His leptin level would be very high if we measured it.' I looked

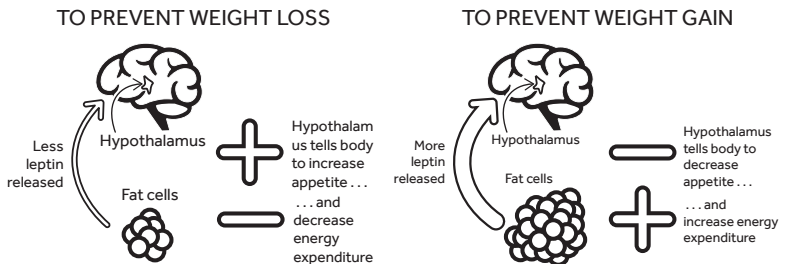


Figure 1: Leptin ensures normal weight control
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up from the stomach dissection, I had nearly got to the top of the stomach and was negotiating the tricky short gastric blood vessels connecting it to the spleen. The students seemed to be stumped by this question . . . then one suggested that the leptin signal might somehow be being blocked.

‘Yes! You are getting there. Mr Johnson has a condition called *leptin resistance*. He has lots of leptin in his blood but it is not being seen by his brain. It’s being hidden. And the culprit is the hormone *insulin*.^{*} Leptin and insulin have a common signalling pathway within the hypothalamus. If insulin levels are high, then the insulin will block the receptor on the hypothalamus that leptin is supposed to activate. Mr Johnson has a typical Western diet that includes lots of sugar and refined carbohydrates, which are sugar precursors. In addition, he will be much more likely to snack between meals. Lots of sugar and snacking leads to lots of insulin being produced, and that insulin blocks the leptin signal from getting through.’

‘That’s just the first way that the leptin signal is blocked.’ I pointed to the TV monitor, and focused in on the gleaming fat hanging off Mr Johnson’s stomach. ‘You see this fat looks abnormal – it’s too moist, it’s inflamed, and the inflammation is caused by his obesity. All this fatty inflammation sends a chemical called *TNF-alpha*[†] into the blood. The TNF-alpha causes inflammation directly to the hypothalamus in the brain, which again blocks the leptin signal from getting through.’

^{*} Insulin is a hormone secreted from the pancreas in response to high levels of glucose (sugar) in the blood. After a meal containing a lot of sugar or refined carbohydrates (pasta, bread, cakes), glucose levels in the blood increase. Insulin acts to direct glucose from the blood into fat cells (and liver and muscle), to store this energy for future use.

[†] Tumour necrosis factor alpha.

How to Eat (and Still Lose Weight)

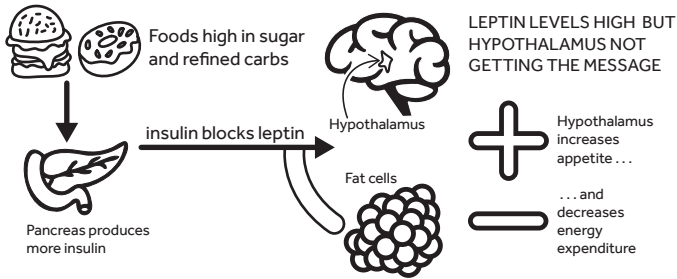


Figure 2: Uncontrolled weight gain from sugars

I had finished the surgical dissection; the stomach was now mobilized enough for its division to begin.

Leptin Resistance = The Disease Obesity

‘So, Mr Johnson has the condition that we call leptin resistance, and what I would call the *disease obesity*. He has far too much fat on board, and therefore has produced high levels of leptin. But due to the nature of his diet, that high leptin signal is being blocked by insulin. He has stored more and more fat, and this has led to inflammation of the fat and inflammation of the hypothalamus, blocking the leptin signal even more. His hypothalamus cannot see the leptin, and therefore cannot sense that he is storing too much fat. In fact, the opposite is true – his brain is getting the signal that there is *not enough* leptin. It is getting signals that he does *not* have enough fat storage.

‘Most people suffering with obesity are getting signals to eat more. Their appetite is high all the time. It’s embarrassing for them to eat too much in public, so quite often they will binge-eat in private. And because doctors and society in general don’t understand the chemical pathways that lead to obesity, people

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with obesity will blame themselves for eating too much, and they will think they are greedy. In addition, the hypothalamus will respond to the signals that they do not have enough fat by going into energy preservation mode. This will make them feel tired and weak as the brain slows down their metabolism.'

Understanding leptin resistance is crucial to being able to control your weight. Sustained weight loss is not about calorie counting (we know low-calorie diets don't work long-term), it's about altering the food that you eat so that your normal system of weight regulation is restored. If you can do this, your weight will naturally reset to a healthier level without any unpleasant feelings of hunger or of missing out.

I explained that leptin acts like the fuel meter signal in your car. Imagine driving along the motorway and you notice the fuel meter flashing empty. You immediately start looking for a gas station (in leptin resistance you would feel hungry), and you might be so worried that you will break down before you can fill up that you start driving slower to preserve fuel (in leptin resistance you would feel tired). When you get to the petrol pump and start to fill up, you realize that the tank is already full and the problem is that your fuel meter is faulty. But in leptin resistance this does not happen; there is no automatic shut-off to over-refuelling as there is at the gas station. The low leptin signal is very real, and despite having plenty of energy reserves in the form of fat you continue to refuel, eating more and more but never seeming to be able to satisfy that hunger . . . leading to further uncontrolled weight gain.

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