

The biscuit tin

A short book about sugar as a reward, a pick-me-up and a comfort, and what it gives back

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First edition

Written by AI with human guidance. It can contain mistakes, which later editions correct.

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Before you start

This is a short book and you can read it in two or three sittings. It's about one habit. Several times a day, between meals, you eat something sweet, and each time you have a reason. Sometimes you've finished a task and earned it, sometimes you're flagging and need a boost, and sometimes you've had a bad phone call and want comforting. The biscuit, the chocolate bar or the slice of cake is doing a job for you each time.

I'm going to argue three things. The first is that the habit is understandable, and that it isn't an addiction in the sense people often fear. The second is that sugar does each of its three jobs badly. As a pick-me-up it leaves most people more tired within the hour. As a comfort it gets the credit for a recovery that would have happened anyway. As a reward it's poor pay that you award yourself on easy terms. I'll give the evidence for each of those, and I'll be straight about the part that's true, which is that a sweet thing does give you a small lift for a few minutes. The third is practical. You go on eating sweet things, with meals and because you like them, and you stop employing them between meals. Chapters 15 and 16 cover how.

Nothing in this book asks you to give up sugar, pudding, birthday cake or chocolate. I don't think sugar is poison and I won't describe it as one. This isn't a diet book and I make no claims about your weight. The argument is about the jobs you give sugar to do, and whether it does them.

Three cautions.

If you have diabetes and you use sugar to treat low blood sugar, nothing here applies to that. The NHS advice for a hypo is to eat or drink something that raises your blood sugar quickly, such as a small glass of fruit juice or a few jelly babies, and that advice comes first. If you have diabetes of any kind, talk to your diabetes team before changing how you eat.

If your eating sometimes feels out of control, this may be more than a habit. The NHS describes the main symptom of binge eating disorder as eating a lot of food in a short time and not being able to stop when full. Other signs it lists are eating when not hungry, eating alone or secretly, and feeling depressed, guilty, ashamed or disgusted afterwards. If that sounds like you, the NHS advice is to see a GP as soon as you can. If you have or have had any eating disorder, please take advice from whoever is treating you before following a book that sets rules about food. The charity Beat runs helplines.

And if you're going through something hard at the moment, such as a bereavement, an illness or a very bad stretch at work, this may not be the month to change anything. The tin will keep.

The notes at the back give my sources and their limits. Where I'm giving my own reasoning and not a finding, I'll say so.

Thursday, five to eleven

It's five to eleven on a Thursday morning and you've just sent off the quarterly figures, which you'd been dreading since Monday. You're working from home. You go to the kitchen, put the kettle on and take the lid off the tin. It's an old tin with a Highland cow on the lid, and it lives on the worktop next to the kettle. You take two chocolate digestives, because you've earned them. They're gone before the tea has cooled enough to drink.

At quarter past three you hit the wall. The screen has gone grey and meaningless and your eyelids are heavy. There's a chocolate bar in the desk drawer, bought for this purpose. You eat it in four bites while reading an email. For ten minutes or so you do feel brighter. By four you're yawning again and thinking about another coffee.

At ten to nine your sister Claire rings about your mum. The carers have changed their hours again, and Claire thinks you should be doing more, and says so. The call lasts twenty-five minutes and you come off it feeling wrung out and slightly in the wrong. You fetch the tin and bring it to the sofa. You have one biscuit, then another. By the end of the programme you've had four, and you couldn't describe the taste of the last two.

On the way to bed you put the tin back by the kettle and feel a bit disgusted with yourself. You resolve to do better tomorrow. Tomorrow is Friday, and on Fridays someone always brings pastries in to the office.

You'd describe yourself as having a sweet tooth. You might say you're addicted to sugar, and you'd only half mean it as a joke. You'd say you've got no willpower. What you probably wouldn't say, because nobody looks at it this way, is that you employed sugar three times today to do three different jobs, and that it's worth asking how well it did them.

I'll use a few terms throughout. **The tin** is wherever your sugar lives, whether that's a tin, a drawer, a cupboard or the shop on the corner. **The three jobs** are reward, pick-me-up and comfort. **The lift** is the brief pleasure and brightening you get from eating something sweet. **The dip** is the tiredness that follows, usually within the hour. **The credit** is what sugar gets when you feel better afterwards, whether or not it had anything to do with it. **Pudding** is a sweet thing eaten as part of a meal because you like it, and it's the use of sugar this book has no argument with.

The habit has some regular features. This list is my own observation and not a research finding.

It happens between meals. The sweet things you eat as part of a meal are rarely the ones that trouble you.

It comes with a reason. You almost never eat a biscuit for no reason at all. There's a small story each time, about deserving it or needing it.

It's fast. The eating takes a minute or two and is usually done alongside something else, such as reading, watching or working.

The amount drifts upward. One becomes two, and two in front of the television become four, without any decision being made.

And it ends with a verdict on your character. The last feeling of the day is often mild self-disgust and a resolution, which makes no difference to what happens on Friday.

Try one thing before reading on. For the next three days, change nothing, but each time you eat something sweet between meals, note the time and which of the three jobs it was doing. Then, an hour later, note how you feel. Most people find that the same few times and the same few reasons come up every day, and that the hour-later note is less cheerful than they expected.

Why the tin is always full

If you recognised that Thursday, you may have the familiar feeling that you're weak. I don't think so, and I'd like to start with how heavily the odds are stacked.

People like sweetness from birth. Newborn babies respond to a sweet taste with what looks very like pleasure, long before anyone has taught them anything. For most of human history sweetness was rare and marked food that was safe and rich in energy, such as ripe fruit and honey. A liking for it was useful. You've inherited that liking, and it now operates in a world where sweetness is the cheapest and most available taste there is.

It is everywhere. There are sweets at the till and the petrol station, pastries in the meeting and a bowl of something on reception, and the coffee shop has a cake cabinet at eye level. A packet of biscuits costs less than a pound. The NHS says that the sugars most adults and children in the UK eat too much of are what it calls free sugars, which means sugar added to food and drink, along with the sugar in honey, syrups and fruit juice. If you eat more of it than is good for you, that's the national condition.

Then there's what you were taught. Think about what sweets meant when you were small. They were what you got for being good at the dentist, for finishing your greens, for a good school report. When you fell over and cried, somebody gave you a biscuit. Sweets were handed out at birthdays, Christmas and Easter, which were the best days of the year. Nobody meant any harm by this. But by the

age of seven you'd had hundreds of lessons in a simple code, in which sweet things mean you've done well, or that things will be all right, or that it's a special day. You still read that code fluently.

In Britain we've built a daily ritual on it. A cup of tea comes with a biscuit. Elevenses, the tea break, a sit-down with a brew and something from the tin are small, decent institutions, and there's friendship and rest bound up in them.

So the three jobs aren't arbitrary. Each one grows out of something real.

Reward. You finished a hard thing and you want it marked. Most work ends with nothing at all. You press send and the next task is already waiting. A biscuit is a way of saying to yourself that something was achieved.

Pick-me-up. You're flagging in the middle of the afternoon and there are two hours still to go. You need to function, and sugar is known to be quick energy. Everyone says so.

Comfort. You're upset and nobody's there, or what's wrong can't be fixed tonight. Something sweet is kind, and it's immediately available, and it doesn't ask anything of you.

Underneath these are needs nobody should be ashamed of. You want your efforts acknowledged, you want energy when you're tired, and you want soothing when you're hurt. The question for the next several chapters is whether the tin meets those needs. I'll argue that it doesn't really meet any of them, and that it stops you looking for whatever would.

"I'm addicted to sugar"

Many people with a daily habit like this describe themselves as sugar addicts. Magazines and documentaries encourage it. You may have read that sugar lights up the same parts of the brain as cocaine, and that rats prefer it to drugs.

It matters whether this is true, for a practical reason. If you believe you're addicted, you'll expect change to involve withdrawal, cravings you can't resist and a lifetime of vigilance. You'll also believe that the only real option is to give sugar up completely, which you don't want to do, so you'll do nothing.

Margaret Westwater, Paul Fletcher and Hisham Ziauddeen, researchers at Cambridge, reviewed the evidence on sugar addiction in 2016. They set what's known about drug addiction alongside what's been found for sugar, in animals and in people. Their conclusion was that there's little evidence to support sugar addiction in humans. People don't develop tolerance to sugar in the way they do to a drug, and they don't go through a withdrawal syndrome when they stop eating it.

The rat studies you may have read about are real, and the review explains what they show. Rats did develop something that looked like bingeing on sugar. But it happened only when the animals were given sugar on a restricted schedule, with access for a limited period each day after hours of going without. Rats with sugar freely available didn't binge on it. The reviewers concluded that the

addiction-like behaviour came from the on-and-off access to a very palatable food, and not from any chemical action of sugar on the brain.

I find that detail interesting for a reason beyond rats, and this is my interpretation. The pattern that produced bingeing was deprivation followed by access. That's the pattern a person sets up when they swear off sugar entirely on Monday, hold out until Thursday, and then open the tin. If strict bans followed by collapses are part of your history, the bans may have been feeding the problem. It's one reason this book doesn't ask you to ban anything.

As for the brain scans, pleasant things do activate the brain's reward circuits. That's what those circuits are for. Music does it, and so does a smile from someone you like or a win for your football team. Showing that sugar does it too shows that sugar is pleasant, which nobody doubted.

So what is going on, if it isn't addiction? I think it's two ordinary things working together. The first is a genuine liking for sweetness, which you were born with. The second is habit, in the plain sense. You've eaten a biscuit with your eleven o'clock tea so many times that the kettle going on calls up the biscuit without your deciding anything. The slump at three calls up the drawer, and a bad phone call calls up the tin. Those links are strong because they've been rehearsed thousands of times, and because the tin is always within reach. A strong habit like that can still be broken.

I don't want to minimise how hard a pull can feel. When you've just put the phone down on your sister, the wanting is real and physical. But the wanting comes from a cue and a memory, and those fade when they stop being rehearsed. It doesn't come from a body in chemical need, and you won't go through withdrawal. If you stopped using sugar for its three jobs tomorrow, the worst you'd face is a few weeks of reaching for something that isn't there, the way you reach for a light switch in a house you've moved out of.

"It gives me a lift"

It does give you one. I want to be straight about this, because a book that told you the pleasure was imaginary would lose you at the first biscuit.

Michael Macht and Jochen Mueller, psychologists at the University of Würzburg, tested it directly. They showed volunteers film clips chosen to put them in a sad mood, a happy mood or a neutral one. Then they gave them either a piece of chocolate or a drink of water. When people were in a low mood, the chocolate improved it, and the water didn't. In a second experiment they compared chocolate that tasted good with chocolate that didn't, and only the good chocolate helped. So the lift exists, and it comes from the pleasure of the taste.

The second experiment also measured how long the improvement lasted, and it was gone after three minutes.

That figure comes from one laboratory and one kind of chocolate, and I wouldn't insist on the exact number. But it fits what you can observe for yourself, and I'd encourage you to observe it. The pleasure of a biscuit is mostly in the first bite or two, while the taste is new. It fades as you chew. A minute after you've swallowed the last of it, you're back where you were, with a slight wish for another one.

Once you know the size of the lift, a few things about the habit make more sense.

It explains why one becomes two. The first biscuit delivered its lift and the lift has gone, so the hand goes back to the tin to fetch another. The second delivers a bit less, because the taste is no longer new. By the fourth, on the sofa, you're eating to chase something that the biscuits stopped providing two biscuits ago. You noticed that yourself on Thursday night, when you couldn't describe the taste of the last two.

It explains why you eat them fast and while doing something else. If the point is a quick hit of pleasure, there's no reason to sit down and attend to it. But a pleasure you don't attend to is hardly a pleasure at all, which makes the return even smaller.

And it shows what the three jobs are up against. A reward, a pick-me-up and a comfort are all meant to change how the next hour or the rest of the evening feels. The tool you're using works for about as long as it takes to boil the kettle. Whatever the tin is doing for you at four o'clock or at half past nine, it isn't the lift, which was over long before.

None of this is an argument against enjoying chocolate. Three minutes of real pleasure is worth having, and chapter 11 is about how to get more out of it. But a few minutes of pleasure can't do a job that needs an hour or an evening.

"I need it to get through the afternoon"

Of the three jobs, the pick-me-up seems the most scientific. Sugar is energy. Your blood sugar is low in the afternoon, so you top it up, and the machine runs again. Athletes do it, which is why there are glucose tablets and energy drinks. It sounds like simple fuel management.

It's been tested many times, because researchers were interested in the same question. Konstantinos Mantantzis and colleagues gathered every good study they could find in which people were given carbohydrate, mostly sugar, or a sugar-free placebo, and their mood was measured afterwards. That came to 31 studies with 1,259 participants. They looked at alertness, tiredness, calmness and general mood, and at different time points after eating.

They found no positive effect of the sugar on any aspect of mood at any time point. The effects they did find went the other way. Within the first hour, people who'd had the sugar were more tired and less alert than people who'd had the placebo. The researchers titled their paper with a question, whether there was a sugar rush or a sugar crash, and their answer was that the rush is a myth.

Robert Thayer's small experiment from the 1980s shows what this looks like in daily life. He had eighteen volunteers try two responses to needing a boost, on different days, in the course of their ordinary routines. On some days they ate a chocolate bar. On others they walked briskly for ten minutes. After the chocolate bar they felt more energetic at first. An hour later they were more tired

than before they'd eaten it, and they were also more tense. After the walk they felt more energetic and less tense, and they still did two hours later.

So the pick-me-up works like this. You're flagging at quarter past three. You eat the chocolate bar. You feel brighter for a short while, partly from the lift in the last chapter and partly from having stopped work and done something. By four you're lower than you started, which is the dip. The dip feels like proof that you needed sugar, so you think about another coffee and whatever else is in the drawer. You can go round that circuit twice in an afternoon.

I'd add my own reading here, which goes beyond the studies. The belief in sugar as fuel survives because the first ten minutes are the part you connect with the chocolate. The tiredness an hour later gets blamed on the afternoon, the job or your age. Nobody thinks, at four o'clock, that they're tired because of what they ate at quarter past three.

There's a fair objection. Sugar really is fuel for muscles doing hard physical work, and a runner two hours into a race does benefit from it. But at a desk your body isn't short of fuel. You had lunch two hours ago. The flat feeling at three has other sources. It's a natural low point in the day's rhythm for most people, and it's made worse by a poor night, a heavy or sugary lunch, a stuffy room and several hours of sitting still. Eating sugar doesn't address any of those causes.

What does work is dull and well supported. Get up and walk briskly for ten minutes, outside if you can. Drink some water. If you're properly hungry, which sometimes you will be, eat some

real food. Chapter 15 goes through the options. For now, on the next afternoon you hit the wall, try Thayer's experiment on yourself. Walk for ten minutes in place of the chocolate bar and then check how you feel at four.

"I've earned it"

You sent off the quarterly figures and took two chocolate digestives from the tin. This is the job that feels most innocent. Rewarding yourself for hard work is what sensible, self-respecting people are supposed to do, and a biscuit seems a modest prize.

Start with a finding about the thought itself. Cat Taylor, Thomas Webb and Paschal Sheeran, psychologists at Sheffield, studied the reasons people give themselves for eating something they'd intended not to. They collected six. People say that they deserve it, or that they're curious to try it. They tell themselves that this occasion is an exception, or that they'll make up for it later. The other two are that the food is simply there, and that it's irresistible. Deserving it came first on their list.

In a further experiment, they quietly prompted some volunteers to think in terms of such justifications, and then gave everyone what was described as a taste test with chocolate. The prompted volunteers ate more. The effect was strongest among the people who held the firmest intentions to limit what they ate.

That last finding is worth a moment. You'd expect good intentions to protect a person. What they seem to do is create a need for a good reason, and "I've earned it" is the best reason going. It arrives at the very moment you've achieved something, it sounds like self-respect, and it can't be argued with. The more serious you are about eating less sugar, the more work that little sentence does.

So it's worth looking at the reward on its own terms, as if it were a pay deal. These are my observations.

Look at who's awarding it. You're the worker, the employer and the judge of whether the work deserves a prize. Under that arrangement everything qualifies. Finishing the figures earns a biscuit, and so does getting through a dull meeting, doing the ironing, a long day or a short one that was annoying. You've never once turned yourself down for a reward.

Look at what the prize is. It's a biscuit costing a few pence, from a tin you can open at any time, and you could have had it without doing the figures. A reward has to be something you wouldn't otherwise get. The biscuit only feels like a prize because of the childhood code from chapter 2, in which sweets were scarce and adults controlled the supply. You control the supply now, and the tin is always full.

Look at how long it lasts. The lift is over in a few minutes. Three days of dread and a morning of concentration went into those figures, and they've been marked with something that was finished before the tea was cool enough to drink.

And look at what it says about the work. If every task needs a sweet at the end of it, that implies the work has no satisfaction of its own, as if you were a child being bribed through homework. I doubt that's how you see your working life. Finishing a hard thing feels good by itself, if it's given a moment. The biscuit tends to take that moment. You go straight from pressing send to the kettle, and the small glow of having done it gets eaten along with the digestive.

The honest objection is that it's harmless. It's two biscuits, and you did work hard. That's true of the biscuits taken alone. The problem is what the habit of rewarding does over time. It turns every effort into an occasion for sugar, which on a busy day means four or five occasions, and it replaces the satisfaction of finishing with a less satisfying substitute.

You do deserve something when you finish a hard piece of work. Chapter 15 suggests what that might be.

"It helps when I'm upset"

Comfort is the hardest of the three jobs to write about, because the feeling behind it is the most real. When you came off the phone to Claire you were hurt and tired, and what's wrong with your mum's care can't be fixed at nine in the evening. The tin was there, and reaching for it felt kind.

So I'll begin with the evidence, which is kinder than you might expect.

Heather Scherschel Wagner, Traci Mann and their colleagues at the University of Minnesota ran four experiments on comfort food. First they asked each volunteer what their own comfort food was, which for many was chocolate, ice cream or biscuits. Then, in the laboratory, they showed the volunteers film clips chosen to make them sad. Afterwards, on one visit, each person was given their comfort food. On another visit they got something different. In one experiment it was a food they liked equally but didn't consider comforting, and in another it was a neutral snack. In two of the experiments they were given nothing at all, and just sat for a few minutes. Their mood was measured throughout.

After the comfort food, people's moods improved. They improved just as much after the other foods. And they improved just as much when people ate nothing. The researchers' summary was that people may be giving comfort food credit for mood effects that would have happened anyway.

I think this is one of the most useful findings in the book. It doesn't say that your sadness is unimportant or that you shouldn't seek comfort. It says that a bad feeling brought on by a bad phone call starts to ease within minutes, whatever you do, and that whatever you happen to be doing at the time gets the credit. For years the thing you were doing was eating biscuits. So you've got a large store of memories in which you felt dreadful, opened the tin, and felt somewhat better. Each of those memories is accurate, but the tin didn't cause the recovery in any of them.

Macht's three minutes from chapter 4 fits in here. The biscuit does add a small, real pleasure on top of the recovery that was already coming. Then it's gone, and the recovery carries on without it.

Next, look at what the tin leaves behind. When you ate four biscuits in front of the television on Thursday, you ended the evening with the original upset somewhat faded, as it would have been anyway, and with a second bad feeling on top, which was the self-disgust on the way to bed. The comfort added a new problem by ten o'clock, and you'd have been better off without it.

There's also what the tin displaces. Comfort, in the full sense, is what a person gets from being heard by someone, or from a bath, a walk, a cry, or writing down what they'd like to say to their sister and not sending it. Those things take a bit more effort than lifting a lid, which is why the tin wins. But some of them deal with the upset itself, and the biscuits don't. After four biscuits the situation with Claire is unchanged, and you haven't told anyone how it made you feel.

An honest objection is that sometimes there's nobody to ring and you haven't the energy for a walk. That's true, and on those evenings I'd rather you were kind to yourself than heroic. Wagner's volunteers who ate nothing didn't do anything heroic either. They sat for a few minutes and let it pass. That option is always open, and nothing is required of you for it. You can sit on the sofa and feel rotten for ten minutes, knowing that it's already easing.

If you find that you're upset most evenings, the biscuits aren't your main problem. If a low mood has lasted for weeks, that's something to take to a GP.

"It's just what I do in the evening"

The three jobs cover most of what the tin does, but if you kept the notes I suggested in chapter 1, you may have found some entries that fit none of them. You weren't rewarding yourself, you weren't tired and you weren't upset. It was nine o'clock, the television was on, and you had something sweet because that's what happens at nine o'clock.

This kind of eating deserves its own short chapter, because the arguments of the last three chapters don't touch it. There's no belief in it to examine. If I asked why you were eating the biscuit, you'd say "I don't know, I just always do."

There's a well-known experiment on this kind of eating. David Neal, Wendy Wood and colleagues gave people going into a cinema a free box of popcorn. Some boxes were fresh. Others contained popcorn that was a week old and had gone stale. Afterwards the researchers weighed what was left. People who rarely ate popcorn at the cinema ate much less of the stale popcorn than the fresh, as you'd expect, because it tasted bad. People with a strong cinema popcorn habit ate just as much of the stale as the fresh. They said afterwards that they hadn't liked it. How hungry they were made little difference either.

The researchers then repeated the experiment in a meeting room, with people watching music videos. There, the habitual popcorn eaters behaved like everyone else and left the stale popcorn alone. The habit ran only in the setting where it had been built. In a

second study, habitual eaters in the cinema were asked to eat with the hand they didn't normally use, and that small disruption was also enough to make the taste matter again.

That's how the nine o'clock biscuit works. The sofa, the programme and the time of evening together call up the eating, and whether you want it or enjoy it has little say. It's how you came to eat the third and fourth biscuits on Thursday without tasting them.

This kind of eating gives you the least, since there isn't even a reason attached, and it's also the easiest kind to change, because nothing is holding it up except the setting. The popcorn experiment shows how. If you change the setting a little, the automatic link stops firing. Here are a few ways of doing that, which are my suggestions.

Keep the tin somewhere that isn't the sitting room or the route to it, as chapter 13 describes. If eating means getting up, finding a chair and reaching into a high cupboard, it stops being automatic.

Have your pudding at the table, with dinner, before the sofa. Then the sweet part of the evening has already happened by the time the programme starts.

Give your hands something else to do for the first couple of weeks. A cup of tea works, and so does knitting, a crossword or the dog's ears. It sounds trivial. The habit is partly a hand habit, as the researchers found when they made people switch hands.

And expect the reach. For a while, at nine o'clock, some part of you will feel that something is missing. It's the same feeling as patting your pocket for keys you've already put down. It doesn't mean you

need a biscuit, and it fades quickly once the evening stops including one.

"It's only a biscuit"

Every individual use of the tin is small. Two digestives or a chocolate bar is nothing, and a slice of the cake someone brought in is nothing either. Anyone who made a fuss about one of them would look ridiculous, which is why you don't make a fuss, including to yourself.

The habit is made of small things, though, and it's worth adding them up once, without any alarm.

The NHS advises that adults have no more than 30 grams of free sugars a day. It describes that as roughly seven sugar cubes. Free sugars are the kind added to food and drink, together with the sugar in honey, syrups and fruit juice. The sugar that comes naturally inside whole fruit, vegetables and milk doesn't count towards the limit, and the NHS says there's no need to cut down on those.

To give you a sense of scale, the NHS points out that a single can of cola can contain as much as nine cubes, which is over the daily figure by itself. I'm not going to give you figures for particular biscuits and bars, because they vary and the packet will tell you. Have a look at a few. The label gives sugar in grams, and a cube is about four grams. On the Thursday in chapter 1 you had six biscuits and a chocolate bar between meals. I'd be surprised if that came to less than the whole day's thirty grams. It came on top of whatever was in your breakfast cereal, your yoghurt and the sauce on your dinner.

I'm not quoting that figure to frighten you. The NHS's own reasons for it are undramatic. Eating too much sugar can make you gain weight, it says, and can cause tooth decay. I make no promises about weight in this book, because what happens to anyone's weight depends on far more than biscuits. But the point about teeth bears directly on this habit, and it's less well known than it should be.

For your teeth, how often you eat sugar matters as well as how much. The NHS advice is to cut down on food and drink containing free sugars and to limit them to mealtimes. Each time you eat something sugary, the bacteria on your teeth produce acid for a while afterwards. If the sugar arrives with a meal, that's one acid attack. If it arrives at eleven, at quarter past three and at nine in the evening, your teeth get three more. Six biscuits spread across a day are worse for your teeth than six biscuits eaten as one pudding.

That's one of the reasons the rule in chapter 16 takes the shape it does. Moving sweet things to mealtimes is what the NHS recommends for your teeth, and it happens to be the change that removes the three jobs.

There's a second thing worth adding up, which is occasions. On that Thursday, sugar was part of three separate episodes in your day, along with the wanting beforehand, the verdict afterwards and the resolution on the way to bed. Add Friday's pastries, the Saturday cinema and Sunday at your mother-in-law's. However small the biscuits are, the habit takes up a fair amount of your attention across a week, more than the pleasure justifies.

"The sugar you drink"

So far I've talked as if the tin held only biscuits and chocolate. For many people a good part of the day's sugar arrives in a cup, a can or a glass, and it does the same three jobs.

The reward is the coffee-shop drink with syrup and cream on the way back from a hard meeting. The pick-me-up is the energy drink or the can of cola at three o'clock, and the comfort is hot chocolate on a bad night. There's also sugar in the background all day, in the two spoonfuls that go into each of six cups of tea and in the glass of orange juice that feels like a healthy start.

Drinks deserve a separate mention for three reasons.

The first is that the amounts are large and easy to miss. The NHS points out that one can of cola can contain as much as nine cubes of sugar, which is more than its suggested limit for the whole day. Two sugars in each of six cups of tea is twelve spoonfuls before you've eaten anything. You'd notice if you ate twelve spoonfuls of sugar from the bowl, but in tea you don't.

The second is that fruit juice counts. People are often surprised by this, because juice comes from fruit and the sugar inside whole fruit is fine. The NHS explains that once fruit is juiced or blended, the sugars are released and count as free sugars. Its advice is to limit fruit juice and smoothies to a combined total of 150 millilitres a day, which is a small glass, and to drink it with a meal to protect your teeth. A large smoothie at your desk in the middle of the morning is, for these purposes, a sweet snack.

The third is that the evidence in chapter 5 applies with full force. Many of the studies in the Mantantzis review gave people their sugar as a drink. The finding of more tiredness and less alertness within the hour is a finding about exactly the three o'clock can. With energy drinks the picture is muddled by caffeine, which does increase alertness for a while, and which is a subject for a different book. The sugar in the can isn't what's helping.

The rule in chapter 16 treats drinks the same as food. A sweet drink with a meal, because you like it, is pudding in a glass. Between meals, the drinks that fit are water, tea and coffee without sugar, milk, and anything else unsweetened.

If you take sugar in tea or coffee, the NHS suggestion is to reduce the amount gradually until you can cut it out. Most people who've done this say the same thing. For a fortnight, tea tastes wrong. After that, tea with sugar in it tastes wrong, and they can't understand how they drank it. That matches the Monell finding in the next chapter, and it's one of the quickest places to see your own sense of taste adjust.

"Life without it would be grey"

If you've followed the argument so far, you may have started to feel uneasy. It's the unease people feel when something they rely on is under threat. Without the tin, evenings would be just a cup of tea. The afternoon would have nothing in it to look forward to, and you'd get through the bad evenings with no help at all. You picture a life that's correct and joyless, in which you eat an apple and resent it.

I'd feel the same if that were what I was proposing. It isn't, and this chapter explains why I think you'll end up with more pleasure from sweet things than you have now.

Start with how much pleasure the current arrangement delivers. Go back over Thursday. The two digestives were eaten standing up while the tea cooled, and they were gone in a minute. The chocolate bar went in four bites while you read an email. You didn't taste the last two of the four biscuits on the sofa. You ate seven sweet things that day and properly enjoyed perhaps two mouthfuls. The habit looks like indulgence, but as a way of getting enjoyment out of sugar it's very inefficient.

Compare that with the last time you really enjoyed something sweet. It may have been a pudding in a restaurant, or a slice of a friend's homemade cake, or a particular pastry from a bakery on holiday. You were probably sitting down, and you'd looked forward to it and were paying attention. You can likely remember it now, which you can't say of any biscuit from the tin this month.

The rule in this book keeps that second kind of eating and drops the first. You'll still have pudding. You'll have chocolate after dinner if you like chocolate. What goes is the distracted, standing-up, between-meals kind, which was never providing much.

There's also some evidence that the pleasure improves when there's less sugar overall. Paul Wise and colleagues at the Monell Chemical Senses Center ran a small trial in which one group of volunteers cut the sugar in their diet by 40 per cent for three months and another group carried on as usual. Every month both groups tasted the same set of puddings and drinks, made with varying amounts of sugar, and rated how sweet each one was. By the second month, the group eating less sugar rated the puddings as sweeter than the other group did. By the third month they rated them as about 40 per cent sweeter. The puddings hadn't changed, so the change was in how the volunteers tasted them.

I should give you the limits. It was a small study, with thirteen people completing the low-sugar diet. The shift showed up in the puddings and not in the drinks. And the volunteers didn't come to find sweet things less pleasant, or to prefer less sweet versions, within the time measured. So I can't promise that you'll lose your taste for sugar. The study suggests a more modest change. When you eat less of it, you taste sweetness more strongly, so you get more effect from a smaller amount. People who cut down commonly report that a biscuit they used to eat without noticing now tastes almost too sweet. That's their report and not a research finding, but it points the same way.

The fear of greyness assumes that the tin is currently brightening your days. If you look honestly at last Thursday, the afternoon had a dip in it that the chocolate helped cause, and the evening ended in self-disgust. There wasn't much brightness to lose. You also won't be giving up tea breaks, or company, or stopping work for ten minutes, or comfort on bad days. All of those stay, and chapter 15 is about making them better.

"It would be rude to say no"

Some of the sugar in your week doesn't come from your own tin at all. It's offered to you. There's the plate of biscuits that comes out with the tea at your neighbour's, the colleague going round the office with a box of chocolates, the friend who says "go on, keep me company" over the dessert menu. In these moments the biscuit is mostly a gesture between two people, and refusing it feels like turning the person down.

That feeling is worth respecting. Offering food is one of the oldest ways people have of being friendly, and accepting it is one of the oldest ways of being friendly back. A book that told you to sit in your neighbour's kitchen reciting rules about free sugars would deserve to be thrown across the room.

But look at what the gesture consists of. Your neighbour wants you to feel welcome and wants to feel that she's looked after you. Those wishes are met by your sitting down, accepting the tea, saying how nice it is to see her and staying for half an hour. She isn't counting biscuits. If you say "Not for me, thanks, but I'd love another cup of tea", you've accepted her hospitality in full. Most hosts won't register the refusal, because people pay far less attention to what others eat than we imagine when we're the one refusing.

It helps to have a few phrases ready, since the awkwardness is mostly in hesitating. "Not for me, thanks" works nearly everywhere. "I'm all right, thank you, I've not long eaten" is always acceptable. "They look lovely, I'll take one for after my lunch" works well with a colleague's box of chocolates, and it fits the rule

too. None of these needs a reason attached, and I'd advise against giving one. Once you say that you're cutting down on sugar, people start talking about your eating. Some will take it as a comment on theirs.

Then there are the times you should simply say yes. If your friend has baked a cake for your visit, eat a slice and enjoy it. That's an occasion, in the sense the rule uses, because it has a date and a person attached to it, and it won't happen again tomorrow. The rule is aimed at three unthinking uses a day. A slice of Margaret's lemon drizzle doesn't come into it.

The line I'd draw is between something offered to you in particular, as a kindness, and sugar that's simply present in the room. The first is part of a friendship and deserves a generous response, which may or may not involve eating it. The second is another tin, even though it isn't yours.

The "go on, keep me company" kind of pressure is a special case. When someone urges you to have a pudding so that they don't have to have one alone, they're asking you to share their own mixed feelings about it. You can keep them company with a coffee. If they're a good friend, you might one day tell them about the three jobs.

"I've got no willpower around it"

At some point in most conversations about sugar, someone says that they simply have no willpower. If there are biscuits in the house, they'll eat them. They've tried to resist and failed many times, and they've concluded that the fault is in them.

I'd like to offer a different reading of the same facts. You've been running a contest between a person and a tin, several times a day, under conditions that favour the tin, and you've blamed yourself for the results.

Look at the conditions. The tin lives on the worktop next to the kettle. You visit the kettle six or eight times a day. Each visit puts the tin at your elbow at the very moment you've stopped work and are waiting for something. You don't need any desire for a biscuit at that moment. You only have to not resist, eight times a day, every day, and sooner or later you will.

Researchers at Cambridge have tested how much position alone matters. Jennifer Hunter, Gareth Hollands, Theresa Marteau and a colleague ran two experiments in which volunteers sat at a table with a bowl of an unhealthy snack on it. For half of them the bowl was twenty centimetres away, and for the other half it was seventy centimetres away. That's still on the same table, needing only a slightly longer reach. In the larger experiment, with 246 people, about seven in ten took some of the snack when the bowl was near and under six in ten when it was far. In the smaller one the gap pointed the same way but was too small to be sure of. Some volunteers pulled the far bowl closer, and when the researchers set

those people aside, the gap widened in both experiments. In the larger experiment, half the volunteers were given a distracting mental task designed to use up their capacity for self-control, and it made no difference to the result. Fifty centimetres changed what people ate, however much self-control they had to spare.

If half a metre of table does that, think what a tin beside the kettle does over a year. Then think what would happen if the biscuits were in a high cupboard in the utility room, behind the flour. You're not forbidden to go and get one. You just have to decide to, fetch the step stool and move the flour. Most of the eleven o'clock biscuits in your life wouldn't survive that much deciding. They were eaten because they were beside the kettle, and not from any strong wish for them.

The same goes for the chocolate bar in the desk drawer, which you bought in advance for the three o'clock slump. Buying it made the decision in advance, on a full stomach in the supermarket. The person who opens the drawer at quarter past three, tired and low, is only carrying it out.

There's a second piece of evidence that the urge itself is more manageable than it feels. Adrian Taylor and colleagues at Exeter took regular chocolate eaters who'd gone without for a few days and had them either walk briskly for fifteen minutes or sit quietly. After the walk their urge to eat chocolate was lower, even when they were handed a bar to unwrap. In a follow-up with seventy-eight regular chocolate eaters, people worked at a computer task with a bowl of chocolates beside them. Those who'd walked first ate

about half as much as those who'd rested, an average of roughly fifteen grams against twenty-nine. Nobody had told them to hold back.

That matters for the willpower story. If the urge were a fixed force that you either resist or don't, a walk wouldn't shrink it. It rises with cues, tiredness and sitting still, and it falls when those change. It's a passing state, and you can let it pass without obeying it. Most urges for a biscuit, left alone, are gone in about the time it takes to make the tea.

Remember too the finding from chapter 6. The people with the firmest intentions were the ones most undone by a good excuse. Trying harder against a well-placed tin with a good story attached to it doesn't work. Moving the tin is more effective, and once it's moved you won't need much willpower.

What the tin costs you

The last few chapters took the jobs one at a time. This one adds up what the whole arrangement costs, leaving aside anything that needs a blood test to detect. These are my observations, and you can check each of them against your own week.

The first cost is your afternoons. On the evidence in chapter 5, the three o'clock chocolate bar is followed by a dip that makes four o'clock worse. If that's a daily event, then some of the grey, slow quality of your late afternoons is self-inflicted, and you've been blaming it on your job or your age.

The second is how your evenings end. On Thursday you went to bed with a verdict on yourself. If the tin comes out most evenings, you're ending most days with a small dose of self-disgust and a resolution you know you won't keep. That repeated failure wears down your confidence in promises you make to yourself, and that spreads to things well beyond biscuits.

The third is your teeth, for the reason in chapter 9. Frequent sugar between meals is the pattern dentists worry about most. The bill for it comes years later and it's a large one.

The fourth is what the three jobs lose by being done badly, which is what I most want you to see. Each job stands for a real need, and the tin has been meeting each one with a token.

Your need to have your work acknowledged has been met, for years, with a biscuit eaten standing up. Nobody, including you, has properly registered most of what you've achieved. You might ask

yourself when you last finished something hard and felt satisfied with it for longer than a digestive lasts.

Your tiredness in the afternoon carries information. It might be telling you that you slept badly, or that lunch was a sandwich at the desk, or that you've been sitting motionless in a stuffy room for three hours. The chocolate bar covers the message without fixing any of those things, so they stay the same, and tomorrow afternoon is no better.

Your upset after the call with Claire was about something that matters, which is your mother's care and your relationship with your sister. Four biscuits helped it fade a little faster, or seemed to. They also meant you didn't ring a friend or talk to your partner, and you didn't work out what you want to say to Claire. The upset faded, and next month it'll be back.

This is what I mean by the subtitle's question of what sugar gives back. It gives back three minutes of pleasure, followed by a dip, and then a verdict. Meanwhile you still haven't felt proud of your work, you're still tired in the afternoons, and you still haven't talked to anyone about your mum.

I should put the other side. None of these costs is a catastrophe. Plenty of people use the tin this way all their lives and come to no great harm, and if you've read this far and decided that your elevenses biscuit is a pleasure you understand and want to keep, that's a reasonable decision for an adult to make. The argument of this book is aimed at the person who ends most days displeased with themselves over it, and who's been trying to solve with willpower a problem that doesn't call for it.

Doing the three jobs properly

If the tin is going to stop doing the three jobs, something else has to do them, because the needs don't go away. This chapter takes each in turn. Apart from the research already described, the suggestions are mine.

Take reward first. What you want when you finish something hard is for the finishing to register. The simplest way is to stop for a moment and register it. When you've pressed send, don't move straight to the kettle or the next task. Sit back and look at what you did. Say to yourself, in words, that the figures are done and that they were hard. It takes ten seconds and it feels slightly silly, and it's more than the digestive ever gave you.

Then mark it in a way that lasts. Tell someone. A message to a colleague or your partner saying that the quarterly figures have gone does what the biscuit was pretending to do, which is to make the achievement exist outside your own head. Tick it off a written list with a proper pen stroke. At the end of the week, look at the ticks.

And take the break. Much of what the eleven o'clock biscuit gives you is permission to stop for ten minutes, and you can have that without the biscuit. Make the tea, sit down with it somewhere that isn't your desk, and drink it while it's hot. Step outside if you can. The break is a fair wage for the work.

For bigger achievements, choose bigger rewards that really are rewards, meaning things you wouldn't otherwise have. When a month-long project ends you might book the long lunch with a friend, or take the afternoon off, or buy the book you've been wanting.

Next is the pick-me-up. When the wall arrives at quarter past three, the first thing to try is Thayer's walk. Ten brisk minutes, outdoors if possible, gave his volunteers two hours of better energy. If you can't leave the building, climb the stairs a few times, or walk the longest corridor and back.

Drink a glass of water. Open a window or move to a different room. Switch for twenty minutes to a task that needs less concentration, since the low point passes by itself within the hour.

If you're hungry, eat. This is important, because sometimes the afternoon wall is plain hunger, particularly if lunch was small or early. Hunger deserves food and not a token. A piece of fruit, a handful of nuts, some cheese and an oatcake, a slice of toast, or a yoghurt will all carry you to dinner. Whole fruit is sweet, and the NHS doesn't count the sugar inside it towards your daily limit, so an apple or a banana at three o'clock is squarely within the rule of this book.

Then look at the causes. If the wall arrives every day, consider your lunch, your sleep, and whether you've moved at all since nine. Those are where the slump comes from, and they can be changed.

The last job is comfort. Start with what the comfort food experiments showed. The feeling will ease by itself within a few minutes, and nothing is required of you for that to happen. Knowing this changes the moment. When you put the phone down and reach for the tin, you feel as if something must be done about the feeling right now. In fact you can sit with it for ten minutes and let it pass.

If you want to do something, do something that is comforting and doesn't end in a verdict. A hot drink counts, and tea made properly is a comfort in its own right. So does a bath or a blanket. You could step outside for five minutes of air, or stroke the dog, or put on music that suits the mood.

Better still, tell someone. Ring a friend, or tell your partner what Claire said and how it made you feel. Being heard is what comfort mostly means, and after it you feel less alone with the problem, which no biscuit manages.

And if the upset is about something that recurs, spend ten minutes on the thing itself once you're calmer. Write down what you'd like to say to Claire. Decide one step you could take about your mum's care. It's the only one of these suggestions that means next month's phone call might go better.

The decision

Here's the rule I'm suggesting.

I eat sweet things with a meal, because I like them. Between meals, the tin stays shut.

It has six parts.

With a meal means as part of breakfast, lunch or dinner. Pudding after dinner fits the rule, and so does a couple of squares of chocolate with your coffee at the end of lunch, or jam on your toast at breakfast. This is the NHS advice for teeth, which is to limit sugary foods to mealtimes, and it separates sugar from the three jobs, because a meal isn't a reward, a pick-me-up or a comfort. It comes round at its usual time whatever kind of day you've had.

Because I like them means you choose it and you taste it. Have the thing you really enjoy, in a sensible portion, on a plate, sitting down, and pay attention to it. A pudding you look forward to and eat slowly gives you more pleasure than the seven distracted items of that Thursday. If you find you don't much want pudding on a given day, don't have it.

Between meals, the three jobs go to their replacements. Finishing something gets a pause, a message and a proper break. The afternoon wall gets a walk and a glass of water. An upset gets ten minutes, a hot drink or a phone call. Chapter 15 has the details.

Hunger between meals gets real food. Fruit, nuts, cheese, toast and yoghurt are all fine. The rule doesn't ask you to go hungry, and you should never be gritting your teeth through genuine hunger because of it.

Occasions are occasions. A birthday, a wedding, Christmas Day, or a friend who's baked a cake and cut you a slice are all things to enjoy wholeheartedly. An occasion has a date and involves other people. "It's Thursday and I've had a day" isn't one. If your workplace produces cake most days of the week, chapter 17 has a section on that.

A lapse is just a biscuit. At some point you'll find yourself at the tin at nine in the evening. When that happens, enjoy the biscuit, put the lid back, and carry on as normal at the next meal. Don't skip pudding tomorrow to make up for it, and don't decide the week is ruined. Chapter 3 described how bans and collapses feed each other, and guilt over a lapse is how that cycle gets started again.

Alongside the rule, make two changes to your surroundings, since chapter 13 showed how much they matter. Move the tin away from the kettle to somewhere inconvenient, such as a high cupboard or the back of the larder. And stop buying sweet things in advance for the three jobs. Take the chocolate bar out of the desk drawer, and don't keep emergency supplies in the car. Buy the pudding you plan to eat with meals and leave it at that.

Plans of the "when this happens, then I'll do that" kind make a decision much more likely to survive a tired afternoon. Peter Gollwitzer and Paschal Sheeran pooled 94 tests of such plans and

found that they made people a good deal more likely to follow through. Here are three, which you can adapt.

When I finish a piece of work and think I've earned something, then I'll send one message saying it's done and take my tea outside.

When I hit the wall in the afternoon, then I'll walk for ten minutes before I decide anything else.

When I put the phone down upset, then I'll put the kettle on and sit with the feeling until the tea is drunk.

As for what to expect, this is my expectation and not a finding. For the first two or three weeks you'll reach for the tin many times a day and find it isn't there, as chapter 3 described. Each time is slightly uncomfortable for a minute or two and then passes. The eleven o'clock reach tends to fade first, because nothing much was behind it. The evening one takes longest. Your afternoons should improve within days, if the evidence in chapter 5 applies to you. After a couple of months, going by the Monell study, sweet things will probably taste sweeter to you. I can't tell you what will happen to your weight, and I'd rather you didn't make that the test.

Birthdays, hypos and other hard cases

If you have diabetes. I said it in the preface and I'll repeat it. If you treat low blood sugar with sugar, that's medicine, and it comes before any rule in this book. Beyond that, how much sugar suits you, and when, is a matter for you and your diabetes team.

If the office produces cake most days. Workplace cake presents itself as an occasion but happens too often to be one. A colleague's birthday once a month is an occasion. A permanent supply on the filing cabinet is a tin that someone else keeps full. A workable line is to join in for a named celebration and leave the everyday supply alone. "Not for me, thanks" is a complete answer and needs no explanation. If you'd like a slice of someone's homemade cake, ask to take it away and have it with your lunch.

If someone at home keeps the tin full. Tell them what you're doing and why. You're not asking them to change, only to let you keep your own supplies out of your way. Most partners are happy to have the biscuits in a different cupboard. If there are children, their snacks can live in a box that's theirs.

If someone shows love with sweet things. Your mother-in-law's trifle is about her, not about sugar. Have some with the meal and enjoy it, which is what the rule says anyway. If she presses a bag of fudge on you for the journey home, accept it, because what she's offering is affection. What happens to the fudge later is your business.

If cravings come with your cycle. Many women find that the pull towards sweet things is stronger in the days before a period. I haven't looked into the research on this and won't pretend to explain it. The practical point is that a stronger urge is still an urge, which means it rises and passes. Pudding with meals is still available on those days, and you might make it a good one.

If you do long or hard physical exercise. Sugar during or straight after a long run or ride is fuel for working muscle and is outside the scope of this book. The three jobs are about desks and sofas.

If you're pregnant. Follow your midwife's advice on eating. Nothing in the rule involves going hungry or cutting out any food, but this isn't the time to take dietary instruction from a general book.

If you switch to sugar-free versions. Diet drinks and sweetened snacks keep the habit going with a different ingredient. Your teeth may be better off, but the three jobs are still being given to a sweet taste, and the reward, the pick-me-up and the comfort are still being done badly. I take no position on sweeteners themselves, which is a separate argument, and the NHS does suggest sugar-free drinks as a swap for sugary ones. If the swap helps you, use it. My own suggestion is to treat sweet-tasting things as sweet things for the purposes of the rule, because the jobs are what this book is about.

If you work nights or shifts. Meals are whenever you have them, and the wall arrives at four in the morning when the vending machine is the only thing open. Bring real food for that hour, and use the walk.

If you're in a really bad stretch. In the first weeks after a bereavement, or while someone's in hospital, leave the rule alone until life steadies. Eat what gets you through. Those weeks don't count against you, and you can pick the rule up again afterwards.

If eating starts to feel out of control, or rules about food start to take over. Go back to the preface. Eating large amounts in secret, feeling unable to stop, or finding that you're anxious and rigid about what you eat, are all reasons to see a GP and not to try harder with this book. Beat's helplines are there for exactly this.

Thursday again

It's a Thursday some months on, and at five to eleven you press send on the quarterly figures. You lean back in the chair and look at the sent message for a moment. They were a pig this quarter, and they're done. You type a line to your colleague Priya, saying they've gone and you never want to see a pivot table again, and she sends back a row of clapping hands.

You go to the kitchen and put the kettle on. The Highland cow tin isn't by the kettle any more. It's in the cupboard over the fridge, and it has some shortbread in it for when your dad visits. For the first fortnight your hand went to the empty space on the worktop every time the kettle went on. It doesn't now. You take your tea out to the back step and drink it in the cold with your coat on, and that's the break.

At quarter past three the wall arrives, as it still does most days. You save your work, put your shoes on and walk to the postbox and round by the park, which takes twelve minutes. When you sit back down the screen makes sense again. The drawer has pens in it.

At ten to nine Claire rings. The carers have changed the hours again, and she still thinks you should be doing more. It's not a good call, and you come off it feeling wrung out. You make a cup of tea and sit on the sofa and feel rotten. After a while you tell Rob what she said. He listens, and says that Claire is frightened and it comes out as blame, which you knew, but it helps to hear. Then you get a

piece of paper and write down two things you could offer to take on, and one thing you're going to say no to. You'll ring her back on Saturday.

You did have pudding today. It was a slice of the lemon tart left from Sunday, after dinner, at the table, with a fork. You ate it slowly and it was sharp and sweet and very good, and you remember it, which you couldn't say of any biscuit you ate in the spring.

Some things haven't changed. You still like sweet things and expect you always will. Two weeks ago you had a dreadful day and ate most of a packet of chocolate fingers in the car outside the supermarket. It happened, and the next day you had breakfast, lunch and dinner as usual and didn't think much more about it. Friday's pastries still appear at the office, and sometimes you take one home for after lunch and sometimes you don't bother.

What has changed is that sugar doesn't have a job any more. When you eat it, it's for the taste. Your work gets acknowledged by you and by Priya. Your afternoons are better. And when you're upset you've been telling someone about it, which you'd stopped doing in the years the tin was handling that for you.

Here's one action. Go and move the tin. Put it somewhere you'd need a chair to reach, and then put the kettle on.

Notes

This book gives general information. It isn't medical or dietary advice, and it's no substitute for a professional who knows your situation. NHS guidance is quoted as I found it in September 2026 and applies to England.

I've kept sources out of the chapters where I could so they read easily. Here they are by chapter, with the limits I'm aware of. Unless I say otherwise, I read the published summary of each paper and not the full text. I checked each paper for a retraction or correction notice in September 2026 and found none on the papers cited. Where a chapter isn't listed, it rests on my own reasoning. That includes chapters 1, 12, 14, 15 apart from the studies already described, and 18. You, Claire, Rob, Priya, Margaret and every other example are invented for illustration.

Before you start. The advice on treating low blood sugar is from the NHS page "Low blood sugar, hypoglycaemia". The symptoms of binge eating disorder and the advice to see a GP are from the NHS page "Binge eating disorder, overview". Beat is the UK eating disorder charity.

Chapter 2. That newborn babies show signs of pleasure at a sweet taste is a long-established finding in the study of taste, and I've given it from general knowledge without checking a particular paper. The definition of free sugars and the statement that most adults and children in the UK eat too much of them are from the NHS page "Sugar: the facts". The account of what sweets meant in childhood is mine.

Chapter 3. Westwater, Fletcher and Ziauddeen, "Sugar addiction: the state of the science", *European Journal of Nutrition* 55, supplement 2, 2016, pages 55 to 69. The summary says they found little evidence to support sugar addiction in humans, and that addiction-like behaviour in animals occurs only with intermittent access. My statements about tolerance and withdrawal are from memory of the full paper. Applying the intermittent access finding to people who ban sugar and then give in is my step and not theirs. Other researchers take the idea of food addiction more seriously than this review does, and the question isn't closed.

Chapter 4. Macht and Mueller, "Immediate effects of chocolate on experimentally induced mood states", *Appetite* 49, 2007, pages 667 to 674. The first experiment had 48 participants. That the second biscuit gives less than the first is my observation, and it fits well-established research on how the pleasantness of a food falls as you eat it.

Chapter 5. Mantantzis, Schlaghecken, Sünram-Lea and Maylor, "Sugar rush or sugar crash? A meta-analysis of carbohydrate effects on mood", *Neuroscience and Biobehavioral Reviews* 101, 2019, pages 45 to 67. There were 176 comparisons from 31 studies. Thayer, "Energy, tiredness, and tension effects of a sugar snack versus moderate exercise", *Journal of Personality and Social Psychology* 52, 1987, pages 119 to 125. The snack was what the American paper calls a candy bar. The list of other causes of the afternoon slump is general knowledge and isn't sourced.

Chapter 6. Taylor, Webb and Sheeran, "'I deserve a treat!': justifications for indulgence undermine the translation of intentions into action", *British Journal of Social Psychology* 53,

2014, pages 501 to 520. The order of the six justifications is the order in the summary, and I don't know that it reflects how common each was. The analysis of the biscuit as a pay deal is mine.

Chapter 7. Wagner, Ahlstrom, Redden, Vickers and Mann, "The myth of comfort food", *Health Psychology* 33, 2014, pages 1552 to 1557. The moods were induced by film clips in a laboratory, which is a good deal milder than a family row, so extending the result to real upsets is my step. Macht and Mueller as above.

Chapter 8. Neal, Wood, Wu and Kurlander, "The pull of the past: when do habits persist despite conflict with motives?", *Personality and Social Psychology Bulletin* 37, 2011, pages 1428 to 1437. That the stale popcorn was a week old, and that the second setting was a meeting room where people watched music videos, are from my memory of the full paper. Applying a finding about cinema popcorn to evening biscuits is my step.

Chapter 9. The 30 gram figure, the seven cubes, the can of cola, and the advice to limit sugary foods to mealtimes are all from the NHS page "Sugar: the facts". The explanation that teeth are attacked by acid for a while after each sugary snack is standard dental teaching, and I haven't sourced it to a particular page.

Chapter 10. The 150 millilitre limit for juice and smoothies, the advice to drink it with meals, and the suggestion to reduce sugar in hot drinks gradually are from the same NHS page. That many studies in the Mantantzis review used drinks is from my memory of the paper and isn't in the summary.

Chapter 11. Wise, Nattress, Flammer and Beauchamp, "Reduced dietary intake of simple sugars alters perceived sweet taste intensity but not perceived pleasantness", *American Journal of Clinical Nutrition* 103, 2016, pages 50 to 60. Sixteen people were assigned to the low-sugar diet and thirteen completed the key tests. Two of the four authors worked for a soft drinks and snacks company, which also makes me cautious about it, though the finding isn't one that obviously suits such a company.

Chapter 13. Hunter, Hollands, Couturier and Marteau, "Effect of snack-food proximity on intake in general population samples with higher and lower cognitive resource", *Appetite* 121, 2018, pages 337 to 347. The figures were 57.7 against 70.7 per cent in the second study and 53.8 against 63.3 per cent in the first. Taylor and Oliver, "Acute effects of brisk walking on urges to eat chocolate, affect, and responses to a stressor and chocolate cue", *Appetite* 52, 2009, pages 155 to 160, with 25 participants who had abstained for three days. Oh and Taylor, "Brisk walking reduces ad libitum snacking in regular chocolate eaters during a workplace simulation", *Appetite* 58, 2012, pages 387 to 392. The averages were 15.6 and 28.8 grams. The participants in both Exeter studies were mostly young. That most urges pass in the time it takes to make tea is my estimate.

Chapter 16. Gollwitzer and Sheeran, "Implementation intentions and goal achievement: a meta-analysis of effects and processes", *Advances in Experimental Social Psychology* 38, 2006, pages 69 to 119. The rule and its parts haven't been tested together, and what I say to expect is my expectation and not a finding.

Chapter 17. The NHS suggestion of sugar-free drinks as a swap is from "Sugar: the facts". I haven't reviewed the research on sweeteners, on cravings across the menstrual cycle, or on sugar in endurance sport, and the chapter says so where it matters.