Chapter 7 Workbook

The Principles of Diabetes-Reversing Diets

Chapter 7 is where the understanding from Part 1 becomes the principles of your plan: three levers, the spike and the floor, and five layers that drain the excess fat, protect your muscle, ease hunger, use timing well and keep the whole thing safe. It is the longest chapter in the book, so this workbook is a little longer than the earlier ones.

The aim is not to memorise study names or numbers. It is to use the mechanisms to make your own decisions: to see why a plan is working, spot what is missing when it isn't, and judge new diet claims for yourself. The questions start easy and climb, and every answer explains its reasoning. None of them asks you to change your medicines or start a fasting pattern; if you take glucose-lowering medication, Chapter 13 explains how to plan changes safely with your doctor.

Andrew

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BEFORE YOU STA RT

How to use these pages

Read this once.
It takes a minute.

1. Close the book. Answer from memory. Write it down, say it aloud, or think it through fully before you look. Recalling an idea strengthens it far more than rereading it, even when your recall is shaky.
2. Note your confidence. Circle S (sure), U (unsure) or G (guess) beside each question, or just note it in your head.
3. Turn the page to check. Every question page is followed by its answer page, with matching question numbers.
4. Mark yourself. Give each question ✓ (right), ½ (partly right) or ✗ (wrong). A question with several parts counts as one, and its answer tells you when to give yourself the mark. The brain dump and the Look ahead question are not marked.
5. Learn most from confident mistakes. Read every explanation, but pay most attention to answers you were sure of and got wrong. Once corrected, those errors tend to stick best of all.
6. Come back later. A gap before you revisit makes the second attempt harder and the learning stronger. The Return ticket at the end shows how.

The five levels

●○○○○	Recall	Bring a fact back from memory.
●●○○○	Understand	Explain what it means or why it is so.
●●●○○	Connect	Link ideas from different parts of the book.
●●●●○	Apply	Use the ideas on a real situation.
●●●●●	Look ahead	Predict what later chapters will say. You are not expected to know these yet, and they are not marked.

Don't skip the easy questions. Fast, confident recall of the basics is what frees your thinking for the harder ones.

On paper or on a screen

On paper: print on A4, double-sided, flipping on the long edge. Each answer page then falls on the back of its questions, so the answers stay out of sight while you work. A pencil is all you need, plus a spare sheet for any answer that needs more room.

On a screen: view one page at a time on a tablet or computer. Think each answer through fully, or say it aloud, before you move on. Nodding along doesn't count. A phone works too, but the pages are A4, so expect to zoom.

Pace: one or two sets per sitting is plenty. Doing them a day after reading the chapter works better than doing them straight away.

Your progress

Set	Date	Right	Sure but wrong	Redone (date)
Set 1 The diet-label illusion		___ / 6		
Set 2 The spike and the floor		___ / 7		
Set 3 Drain the excess		___ / 7		
Set 4 Keep your muscle		___ / 8		
Set 5 Make hunger easier		___ / 8		
Set 6 Calm the food environment		___ / 7		
Set 7 Make timing earn its place		___ / 8		
Set 8 Protect the whole plan		___ / 8		
Set 9 Join it all up		___ / 5		

The methods here come from the research on learning summarised in Make It Stick (Brown, Roediger and McDaniel, 2014): retrieval practice, spacing, mixing topics, explaining in your own words, and checking your confidence against your results.

1 The diet-label illusion

About 12 minutes
Close the book first

Chapter sections: Only three levers matter · What can we learn from diabetes reversal studies?

Start with the brain dump: it shows you what you remember before any question gives you clues. Then the chapter's first big idea, that diets are combinations of levers rather than rival belief systems.

1.1 Three-minute brain dump. Close the book. Take a blank sheet of paper or a notebook and write down everything you remember from Chapter 7. Words, short notes, arrows and sketches are all fine. Don't worry about order or neatness. Stop after three minutes. ● ○ ○ ○ ○ RECALL

Prefer not to write? Explain everything you remember aloud instead.

1.2 Three levers. Which lever does each approach pull most strongly? Write W (what you eat), T (when you eat) or H (how much you eat). Use two letters where two levers are pulled hard. S U G

● ● ○ ○ ○ UNDERSTAND

□	a. Swapping sugary foods for lower-carbohydrate choices
□	b. Eating only within an eight-hour window each day
□	c. Smaller portions of the same familiar foods
□	d. Total diet replacement: complete low-energy shakes and soups in place of meals
□	e. Mediterranean-style eating, with portions trimmed to lose weight

1.3 Kanbour and colleagues pooled randomised trials of many different approaches to type 2 diabetes. Which factor stood out as by far the strongest predictor of remission? ● ○ ○ ○ ○ RECALL S U G

○ A How long people had had diabetes
○ B The type of intervention used
○ C How much weight people lost
○ D The diet's share of carbohydrate

1.4 What did Hosseini's 2022 analysis find about total carbohydrate intake and later risk of type 2 diabetes? ● ○ ○ ○ ○ RECALL S U G

○ A No clear, strong link in either direction
○ B Risk rose steadily with every extra serving
○ C Carbohydrate quality makes no difference
○ D Lower intakes clearly prevented diabetes

1.5 True or false? "The DIETFITS trial proved that low-fat and low-carb diets give identical diabetes remission rates." If false, correct it. ● ● ○ ○ ○ UNDERSTAND S U G

1.6 In DIETFITS, the two diets gave similar average weight loss, yet some people lost about 30 kg and a few gained weight. How can both be true, and what does it suggest about choosing a diet? S U G

● ● ● ○ ○ CONNECT

1.7 Two people follow different menus, one mixed and one lower in carbohydrate. Both keep up similar energy deficits and lose similar amounts of fat. Which explanation fits best? S U G

● ● ● ○ ○ CONNECT

○ A The menus improve glucose by entirely separate routes
○ B Only the lower-carb menu can bring the floor down
○ C Their shared deficit can reduce excess organ fat in both
○ D Once energy is controlled, food choice makes no difference

Turn the page to check your answers.

1 The diet-label illusion

Mark each question ✓, ½ or ✗

1.1 Not marked. The point is to find out what you can recall before any question gives you clues. The gaps you noticed show you where to look. Keep your sheet, or jot down a few words about what you managed aloud. You will repeat the brain dump on the Return ticket and can compare.

1.2 a W · b T · c H · d W + H · e W + H Total diet replacement pulls very hard on what and how much, and the Mediterranean diet pulls more gently on several levers at once. Real plans often pull more than one, so a sensible extra letter with a reason counts as right. The skill is classifying what changed, not choosing a tribe. Mark: four of the five.

1.3 C. How much weight people lost; nothing else came close. Once weight loss was taken into account, factors such as diabetes duration (A) and type of intervention (B) showed no clear independent link with remission in this analysis. That doesn't prove they never make a difference for an individual, as Chapter 1 noted for longer diabetes duration.

1.4 A. No clear, strong link either way, so the blunt claim that carbohydrates cause diabetes isn't supported. C is the trap: this does not make carbohydrate quality irrelevant, and it doesn't make carbohydrate restriction useless once diabetes is present.

1.5 False. DIETFITS put 609 adults on a healthy low-carb or healthy low-fat diet for a year and looked at weight loss. Average weight loss was the same, and so were improvements in glucose control and insulin sensitivity, but it was not a trial of remission in type 2 diabetes. And the averages hid big individual differences (1.6).

1.6 Model answer: An average describes the group, not each person. Within each diet, results ranged from large losses to small gains, and the range was similar on both diets. The winners on both sides were the people who found their diet workable enough to keep going. So choose the approach you can sustain, rather than hunting for the 'ideal' diet.

1.7 C. Different food rules, same mechanism: a sustained deficit drains excess fat from the liver, pancreas and muscle, whichever menu produced it. D goes too far. Food choice still shapes hunger, nutrition, the size of after-meal spikes and how easy the plan is to keep, as later layers show.

Marked questions right: ____ out of 6 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading the sections Only three levers matter and What can we learn from diabetes reversal studies?.

2 The spike and the floor

About 15 minutes
Close the book first

Chapter sections: The spike and the floor · The fruit and fructose fracas

Two layers of glucose with two different sources. This distinction explains why some changes help one layer and leave the other relatively unchanged.

2.1 Which mainly sets each of these: the spike after a meal, or the floor between meals? Write S or F. ● ● ○ ○ ○ UNDERSTAND S U G

☐	a. How much carbohydrate arrives from the meal
☐	b. How well insulin restrains the liver's glucose output when no food is arriving
☐	c. How quickly muscles and your pancreas clear glucose from the blood after eating
☐	d. Stress hormones and disrupted daily rhythms tipping the liver towards releasing glucose
☐	e. Excess liver absorption of insulin after eating

2.2 Riddle. "You haven't eaten for hours, yet I'm still putting glucose into your blood. That's my ordinary job, but in diabetes I overdo it." Who am I, and why do I overdo it? ● ● ● ○ ○ CONNECT S U G

2.3 After changing his dinner, Jake's after-meal peak is much lower, but his morning fasting readings are still high. Which explanation fits best? ● ● ● ● ○ APPLY S U G

- ○ A His liver has stopped releasing glucose overnight
- ○ B Undigested dinner carbohydrate keeps fasting glucose up
- ○ C Lower peaks make no difference to overall exposure
- ○ D Meal glucose is lower, but his liver still releases too much

2.4 Person A has one short, high peak after each meal but low glucose between meals. Person B has only moderate peaks, but glucose that stays raised between meals and all night. Why can't you tell who is doing better from the highest peak alone? ● ● ● ○ ○ CONNECT S U G

2.5 Ravi swaps bread, rice and fruit for cheese, cream and nuts, eating about the same total calories. His spikes shrink, but over two months his weight and fasting glucose barely change. Which lever has he pulled, which hasn't he, and why might his floor stay high? ● ● ● ● ○ APPLY S U G

2.6 "My urine strips show I'm producing ketones, so my liver fat has cleared and my diabetes is reversed." What is wrong with this reasoning? ● ● ● ○ ○ CONNECT S U G

2.7 Ella replaces her usual apple and berries with a large glass of 100% fruit juice. "It's still fruit, so it must be just as good," she reasons. What two important differences is she overlooking? ● ● ● ○ APPLY S U G

Turn the page to check your answers.

2 The spike and the floor

Mark each question ✓, ½ or ✗

2.1 a S · b F · c S · d F · e S — The liver appears on both sides: how well insulin turns down its output while a meal arrives shapes the spike, and how well it restrains output between meals sets the floor. Mark: four of the five.

2.2 The liver. Releasing glucose between meals and overnight is its normal fasted-state job (Chapter 2). In diabetes, a fat-laden, insulin-resistant liver and a weaker insulin response mean that output is no longer properly restrained, so the floor stays raised long after dinner is digested.

2.3 D. Lowering the carbohydrate at dinner shrank the meal-driven spike, which is a real benefit. The fasting reading is the floor, set mainly by the liver's own glucose output. A and B confuse the two sources. C is wrong because spikes add to total exposure too.

2.4 Model answer: HbA1c reflects glucose exposure across the whole day and night, so height and duration both count. A raised floor lifts the whole profile for many hours, like a high tide, while a short peak covers less time. Without measurements you can't say who has the higher HbA1c, but the peak alone can't tell you.

2.5 Model answer: He has pulled what, but not how much. Less carbohydrate shrinks the spike, but replacing those calories with fat leaves no energy deficit, so the excess fat in his liver and pancreas stays. That fat keeps the liver resistant to insulin and its glucose output high, which holds the floor up. Low-carb eating can work well, but only when it also creates a deficit.

2.6 Ketosis shows that carbohydrate is very low and the liver is making ketones from fat. It doesn't show that excess organ fat has gone, that the floor has come down or that HbA1c is in the remission range. Ketosis is not required for remission and is not proof of it.

2.7 Any two of these: whole fruit contains water, fibre and intact cell structures that help slow sugar absorption and make it more filling; a large glass of juice can contain the sugar of several pieces of fruit, with much less fibre and none of the chewing; juice is treated as a concentrated source of sugar, which the chapter recommends limiting during reversal. Best to favour whole fruit, keep portions of sweeter fruit sensible and use your own readings as the final guide. Mark: two of these points.

> FROM ANDREW
>
> *If you check your glucose at home, this distinction will save you a lot of confusion. A smaller spike after dinner is real progress, but the floor tells you most about whether the problem underneath is shifting.*

Marked questions right: ____ out of 7 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading the sections The spike and the floor and The fruit and fructose fracas.

3 Drain the excess

About 12 minutes
Close the book first

Chapter section: Layer 1: Drain the visceral and ectopic fat

Layer 1 is the engine of reversal. This set is about what an energy deficit changes, in what rough order, and why results differ between people.

3.1 Complete the chain. ● ● ○ ○ ○ UNDERSTAND S U G

A sustained energy deficit → the body uses more energy than arrives from food → stored fuel is _____ → excess liver fat _____ → the liver responds _____ to insulin → the floor _____

3.2 Which change does the chapter describe as one of the earliest after a strict deficit begins? S U G

● ○ ○ ○ ○ RECALL

○ A Beta cells regain function
○ B Pancreatic fat falls
○ C Muscle mass increases
○ D Liver fat falls

3.3 Two weeks into a strict deficit, Jennifer's fasting readings have improved markedly, though she has lost only a little weight. Does that mean her readings are misleading? Explain. ● ● ● ● ○ APPLY S U G

3.4 Following figure 7.2, write E beside the changes that tend to come earlier and L beside those that tend to come later. Then say why the order is only approximate. ● ● ● ○ ○ CONNECT S U G

□	Pancreatic fat falls
□	Liver fat falls
□	The liver releases less glucose
□	Beta cells improve insulin delivery

3.5 Glucose control often improves within days of weight-loss surgery. What did studies comparing matched very-low-calorie intake, with and without surgery, suggest? ● ● ● ○ ○ CONNECT S U G

○ A Surgery repairs the pancreas directly
○ B Most early gains come from losing water
○ C The early gains appeared in both groups
○ D Only surgery produced early gains

3.6 Fix the headline. "Scientists prove the pancreas repairs itself in ten days on a low-calorie diet." Rewrite it so it matches the chapter. ● ● ● ● ○ APPLY S U G

3.7 Two people each lose 8 kg. One reaches near-normal glucose; the other still has raised readings. Does this disprove the role of fat loss? Give two reasons their results might differ. S U G

● ● ● ○ ○ CONNECT

Turn the page to check your answers.

3 Drain the excess

Mark each question ✓, ½ or ✗

3.1 Stored fuel is mobilised (used) · liver fat falls · the liver responds better to insulin · the floor falls. The deficit's power is that it reverses the direction of fuel traffic, from storage towards use. Mark: three of the four.

3.2 D. Lim and colleagues found liver fat falling within days of strict energy restriction, along with better liver insulin sensitivity. Pancreatic fat (B) falls over the following weeks and months, and beta-cell recovery (A) takes longer and varies.

3.3 Model answer: Not necessarily. Liver fat can fall within days, so the liver responds better to insulin and releases less glucose, and the floor can drop before much weight comes off. In the very-low-calorie diet studies, 80–90% of the eventual fall in fasting glucose came in the first ten days. Her trend over the coming weeks will say more than any one reading. If she takes glucose-lowering medicine, falling readings are something to discuss with her healthcare team (Chapter 13).

3.4 Pancreatic fat falls L · Liver fat falls E · Liver releases less glucose E · Beta cells recover L · Muscle insulin sensitivity improves alongside. The figure shows an approximate sequence: the changes overlap, and their timing and extent vary with the person and the stage of their diabetes. Mark: All four letters and a sensible reason.

3.5 C. The same early gains appeared with severe energy restriction alone, pointing to the profound energy deficit, with its rapid fall in liver fat, as a major driver. That is what the physiology of Part 1 predicts.

3.6 Example: "Severe energy restriction can cut liver fat and improve fasting glucose within days; recovery of insulin-making cells in the pancreas takes weeks or months and varies between people." Any version that separates the fast liver changes from slower, variable pancreatic recovery is right.

3.7 Model answer: No. People start in very different places. Someone further beyond their personal fat threshold (Chapter 3) may need to lose more. Beta-cell recovery varies and tends to be greater earlier in the course of diabetes. Lifestyle drivers such as sleep and stress also differ. Chapter 1 showed the same pattern: some people reach remission after modest weight loss, and others need more. Mark: two sensible reasons.

Marked questions right: ____ out of 7 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading the section Layer 1: Drain the visceral and ectopic fat.

4 Keep your muscle

About 15 minutes
Close the book first

Chapter section: Layer 2: Protect the future you

Weight loss is not pure fat loss. This set is about why muscle is lost in a deficit, and the three countermeasures that protect it.

4.1 In 'muscle protein turnover', the protein in muscle is… ● ○ ○ ○ ○ RECALL S U G

- ○ A built in early adulthood and then kept
- ○ B broken down steadily and rebuilt in pulses
- ○ C broken down only while you are dieting
- ○ D rebuilt steadily and broken down in pulses

4.2 In the block-on-a-slope picture, what makes the block slide down, what pushes it back up, and what does an energy deficit do to the slope? ● ● ○ ○ ○ UNDERSTAND S U G

4.3 An energy deficit pushes on muscle in three ways. Match each pressure to its main countermeasure. Write the letter in the box. ● ● ● ○ ○ CONNECT S U G

Pressure	Countermeasure
□ 1. Supply: fewer amino acids arriving	A. Resistance workouts and more muscle challenge
□ 2. Signalling: weaker signal to rebuild	B. Enough total protein every day
□ 3. Loading: less work done by the muscles	C. Protein in amounts and at intervals that trigger rebuilding

4.4 "I have months of fat in storage. Why would my body touch my muscle while I diet?" What has the speaker missed? ● ● ● ○ ○ CONNECT S U G

4.5 Which statement matches the chapter's account of leucine? ● ● ○ ○ ○ UNDERSTAND S U G

- ○ A It is both a building block and a signal
- ○ B Enough of it makes daily protein less important
- ○ C It stops muscle breakdown whenever it is eaten
- ○ D Its effect rises smoothly with the amount eaten

4.6 Two people eat the same total protein. One eats nearly all of it at dinner; the other spreads it over three protein-rich meals. Whose muscles are likely to benefit more, and what does the chapter put ahead of spreading protein out? ● ● ● ● ○ APPLY S U G

4.7 Jas has lost weight fast, but now struggles with stairs she used to manage easily. She has cut her meals to tiny portions and stopped her usual walks. Which pressures may be at work, and what should she review? ● ● ● ● ○ APPLY S U G

4.8 The protein leverage hypothesis suggests that… ● ● ○ ○ ○ UNDERSTAND S U G

- ○ A the body stores spare protein
- ○ B low-protein food can drive overeating
- ○ C more protein means more fat stored
- ○ D protein is the least filling nutrient

Turn the page to check your answers.

4 Keep your muscle

Mark each question ✓, ½ or ✗

4.1 B. Breakdown runs at a fairly steady rate around the clock; synthesis rises in pulses after protein-rich meals and after muscle challenge. D is the reversal of this, and it is the detail that explains why meals and exercise can push the balance back.

4.2 Model answer: Steady breakdown makes the block slide; the pulses of synthesis after protein meals and muscle challenge push it back up. An energy deficit makes the slope steeper, so the usual pushes may no longer be enough. Protein provides the push, and resistance training tells the body the block's height counts.

4.3 1 B 2 C 3 A The second countermeasure is where leucine comes in. In practice they overlap: protein and muscle challenge work best together. Mark: all three.

4.4 Model answer: Fat is an energy store, not a store of amino acids. Every protein in the body, from enzymes to immune cells, is constantly turning over and needs a steady supply of amino acids. When too little arrives from food, the only sizeable reserve is skeletal muscle. On top of that, a deficit turns down the rebuilding signal, and less activity reduces loading.

4.5 A. Leucine is an essential amino acid, and its arrival also tells muscle cells that nutrients are on board. D is the tempting one: the response is threshold-like, rising strongly once enough arrives and falling away quickly just below that. B is wrong because daily total protein comes first.

4.6 The person spreading it out: each protein-rich meal gives the muscles another chance to respond. But the chapter's order of priority is daily total first, then protein quality, then spreading it across the day. The practical aim is around 2–3 g of leucine in each main protein meal; if you can manage only two, prioritise the first and last meals of the day.

4.7 Model answer: Probably all three: tiny portions mean too little protein (supply), a large deficit turns down the rebuilding signal and increases the rate of breakdown (signalling), and stopping her walks reduces loading. Crash dieting makes lean-tissue loss worse. She should review the size of her deficit, her protein intake and her activity, adding resistance work. Losing strength is not a sign the diet is working; if the weakness is new and unexplained, she should mention it to her doctor. Mark: two pressures and a sensible review.

4.8 B. If protein is heavily diluted by fat and carbohydrate, appetite may keep pushing until protein needs are met, so more total energy goes in. It is one insight into overeating, not the whole story. D is the opposite of the chapter: protein is the most filling macronutrient.

> FROM ANDREW
>
> *The scales can't tell fat from muscle, which is why this layer is easy to neglect. A plan that leaves you weaker has cost you something you will want later, so reat strength as a result to track alongside weight.*

Marked questions right: ____ out of 8 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading the section Layer 2: Protect the future you.

5 Make hunger easier

About 12 minutes
Close the book first

Chapter section: Layer 3: Outwit hunger, from Energy density to Neil's story

A deficit only works if you can keep it. This set is about meals that satisfy you with less energy.

5.1 Energy density means… ● ○ ○ ○ ○ RECALL S U G

- ○ A calories per serving
- ○ B calories per gram of food
- ○ C nutrients per calorie
- ○ D how fast a food is digested

5.2 About 500 kcal of boiled potato weighs roughly 600 g; 500 kcal of cashews weighs about 80 g. For the same calories, which is more likely to leave you satisfied, and why? ● ● ○ ○ ○ UNDERSTAND S U G

5.3 Food A has 90 kcal per 100 g. Food B has 240 kcal per 100 g. How much of each could you eat for 360 kcal? ● ● ● ● ○ APPLY S U G

Food A: _____ g Food B: _____ g

5.4 Match each kind of fibre to its main effect. ● ○ ○ ○ ○ RECALL S U G

Fibre	Main effect
□ Soluble fibre	1. Adds bulk
□ Insoluble fibre	2. Feeds your gut microbes
□ Fermentable fibre	3. Forms a gel that slows glucose absorption

5.5 In meal-order studies, people ate identical foods in a different order. Eating the protein and non-starchy vegetables first cut the after-meal glucose peak by around 30%. Why does using identical foods make this result convincing, and what doesn't it tell you? ● ● ● ○ ○ CONNECT S U G

5.6 Competitors in eating contests eat very fast at the start, even when the contest is about the total eaten. Why? ● ● ○ ○ ○ UNDERSTAND S U G

- ○ A Food is easier to digest when eaten quickly
- ○ B The stomach stretches further when food arrives fast
- ○ C Fast eating raises the body's metabolic rate
- ○ D Fullness signals take time, so speed outruns them

5.7 Neil sometimes gets intense, ordinary hunger while dieting, and used to treat one big unplanned snack as proof he had ruined the week. What two different problems did his rescue-food plan solve? ● ● ● ● ○ APPLY S U G

5.8 Your usual lunch is a small pastry and a sweet, milky coffee. Suggest two changes that would make a lunch with similar calories more filling, and say why each helps. ● ● ● ● ○ APPLY S U G

Turn the page to check your answers.

5 Make hunger easier

Mark each question ✓, ½ or ✗

5.1 B. Calories per gram (or per millilitre of volume). A is easily confused with it, but two servings with the same calories can differ hugely in weight and volume, and that difference is the point.

5.2 Model answer: The potato. It is about seven times the weight, fills a good part of a plate and takes far longer to eat, so stretch sensors in the stomach signal fullness and keep you satisfied for hours. The handful of nuts is gone in minutes and tends to leave you wanting more. Both foods can be part of a healthy diet; the lesson is energy density.

5.3 Food A: 400 g. Food B: 150 g. The same energy gives twice the volume of the lower-density food, which makes holding a deficit easier.

5.4 Soluble 3 · Insoluble 1 · Fermentable 2 In real foods the types overlap, and many foods contain more than one kind. Mark: all three.

5.5 Model answer: With the same food and quantities, the only thing that changed was the order, so the smaller peak can be put down to the order itself. It doesn't show that people ate fewer calories or lost weight, and it isn't a guaranteed 30% for every meal or a 30% fall in HbA1c.

5.6 D. Fullness signals take time to rise during a meal, so eating fast gets food in before they arrive. That is why eating slowly, putting your fork down between bites or serving half the meal first and pausing, lets satiety catch up.

5.7 Model answer: First, a practical problem: big, filling, lower-energy foods kept on hand (skyr, popcorn, cottage cheese and crackers) let him eat a huge portion for a few hundred calories. Second, a thinking problem: one hard afternoon is a rounding error in a plan that runs for months, not proof of failure, so the old all-or-nothing spiral was broken. Shaky, sweaty or confused feelings are different: they can mean low blood glucose and must not be ignored. Mark: both problems.

5.8 Examples: add a lean protein (such as Greek yoghurt or a boiled egg), which is the most filling macronutrient; add a large, low-energy-density side such as soup, salad or berries; switch to a higher-fibre choice; drink the coffee less sweet and milky so the calories go to food you chew. Many answers are right if each has a reason. Mark: two changes, each with a reason.

Marked questions right: ____ out of 8 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading that part of Layer 3: Outwit hunger.

6 Calm the food environment

About 12 minutes
Close the book first

Chapter section: Layer 3: Outwit hunger, from Ultra-processed food to the meal rotation

Your appetite responds to the food around you as well as the food on your plate. This set is about why, and what to do about it.

6.1 Food scientists use the term food matrix for… ● ○ ○ ○ ○ RECALL S U G

- ○ A the nutrient list on a label
- ○ B the mix of foods in a meal
- ○ C the natural structure of whole food
- ○ D the pattern of meals across the day

6.2 Many ultra-processed foods have had their natural structure broken down. Using the idea of the food matrix, give two reasons this can lead people to eat more. ● ● ● ○ ○ CONNECT S U G

6.3 Hall's 2019 trial was a randomised crossover study: 20 adults on a metabolic ward ate each diet for two weeks, in random order. What does ‘crossover’ mean here, and why does it strengthen the comparison? ● ● ○ ○ ○ UNDERSTAND S U G

6.4 On the ultra-processed diet, Hall's participants ate about 500 kcal a day more. Which conclusion does the trial support? ● ● ● ○ ○ CONNECT S U G

- ○ A The two diets led to very different spontaneous intakes
- ○ B Processing alone has been isolated as the single cause
- ○ C Every processed food leads to 500 kcal of overeating
- ○ D The extra intake came from extra sugar in the processed diet

6.5 Write N (hyper-novelty), C (hyper-choice) or A (hyper-availability) beside each. ● ○ ○ ○ ○ RECALL S U G

□	a. A new limited-edition snack appears every week
□	b. A takeaway promises food at your door in 30 minutes
□	c. A delivery app shows 60 menus, and you keep comparing them

6.6 Sam plans to cook at home but scrolls delivery apps every evening and usually orders something extra. Which of the three 'hypers' are at work, and how could deciding tomorrow's dinner tonight help? ● ● ● ● ○ APPLY S U G

6.7 Why might eating a small set of enjoyable meals on repeat make a deficit easier, even though it cuts variety? When would it become a bad idea? ● ● ● ● ○ APPLY S U G

Turn the page to check your answers.

6 Calm the food environment

Mark each question ✓, ½ or ✗

6.1 C. The layered structure of real food, from a steak to an apple, which takes time and effort for digestion to break down. That slows eating and digestion, gives fullness signals time to work and slows the entry of nutrients into the blood.

6.2 Any two of: with fibre and water removed, the food is easier and faster to chew and swallow; it is denser in energy; it is digested faster, so fullness signals have less time to rise; added sugars, fats and flavourings make it more moreish; many are low in protein. Mark: two reasons.

6.3 Every participant ate both diets, one after the other, so each person was compared with themselves, removing the differences between people. Randomising which diet came first stopped the order lining up with one diet. Kahleova's trial in Set 7 uses the same design.

6.4 A. Under these conditions, the tested diets led to very different free-choice intakes: weight loss on one and gain on the other. B is too strong, because many properties changed together (texture, speed of eating, energy density, palatability), so no single cause was isolated. D fails because the diets were matched for sugar, fat and calories presented. The one word that breaks B is alone.

6.5 a N b A c C Novelty sparks fresh desire, choice keeps you comparing and dissatisfied, and availability removes the effort between wanting food and eating it. Mark: all three.

6.6 Model answer: Choice (the scrolling and comparing) and availability (food at the door in minutes), with novelty from new offers too. Deciding in advance removes the choice at the moment of impulse, and having the meal already planned puts back some of the friction that availability took away. The problem is the environment, not a lack of character.

6.7 Model answer: Fewer decisions, less novelty and less comparing mean less stimulation and less need for willpower; the goal is “Just the usual?” It becomes a bad idea if the meals aren't enjoyable, are nutritionally narrow, don't fit family and social life, or tip into rigid ‘monk mode’ restriction.

Marked questions right: ____ out of 7 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading that part of Layer 3: Outwit hunger.

7 Make timing earn its place

About 15 minutes
Close the book first

Chapter section: Layer 4: Use timing and spacing to your advantage

When you eat, how often and when you move can each tilt the system in your favour.

7.1 Match each change to the principle it mainly uses. Write the letter in the box. ● ○ ○ ○ ○ RECALL S U G

Change	Principle
□ Three meals with clear gaps instead of grazing	A. Movement after meals
□ Eating more of the day's food earlier	B. Time-restricted eating
□ Keeping all food inside a chosen eight-hour window	C. Meal spacing
□ A ten-minute walk after dinner	D. Time of day

7.2 In 16:8 time-restricted eating, you… ● ○ ○ ○ ○ RECALL S U G

○ A eat for 16 hours, then fast for 8
○ B eat two meals within 8 hours
○ C fast until 4 p.m., then eat until midnight
○ D go 16 hours without food, including sleep

7.3 Why does the chapter say grazing is likely to be unhelpful, even if you don't overeat? S U G

● ● ○ ○ ○ UNDERSTAND

○ A It keeps you in the fed state all day
○ B It slows the digestion of each meal
○ C It stops the liver storing glycogen
○ D It lowers insulin sensitivity overnight

7.4 Kahleova's trial found better results with two meals early in the day than with six meals. A headline says: "Two meals beat six, whenever you eat them." What else changed besides the number of meals, and why does require caution interpreting the results? ● ● ● ○ ○ CONNECT S U G

7.5 In Pavlou's six-month trial, the 16:8 group lost about 3.6% of body weight against 1.8% with calorie restriction, but HbA1c fell by about the same in both. Name one conclusion the trial supports and one it doesn't. ● ● ● ○ ○ CONNECT S U G

7.6 Two people each walk 30 minutes a day. One walks once, mid-morning; the other walks 10 minutes after each meal. Why might the second person's after-meal glucose be lower, even though the total walking is the same? ● ● ● ● ○ APPLY S U G

7.7 Someone who takes a medicine that can cause low blood glucose wants to start skipping breakfast and try two very-low-intake days a week. What should they do before trying either, and why? ● ● ● ● ○ APPLY S U G

7.8 Leah works rotating shifts and can't always eat early in the day. Must she give up on this layer? Suggest two adjustments that fit her life. ● ● ● ● ○ APPLY S U G

Turn the page to check your answers.

7 Make timing earn its place

Mark each question ✓, ½ or ✗

7.1 Gaps C · Earlier D · Window B · Walk A Some changes do more than one job: a window usually creates spacing too. Mark: all four.

7.2 D. Sixteen hours without food, including sleep, then an eight-hour eating window. There is no fixed number of meals or start time, nothing special about 16:8, and the window is not a licence to overeat. C misreads the numbers as clock times.

7.3 A. With food arriving constantly, you never finish dealing with the last meal before the next one comes, so glucose and insulin stay raised and you never leave the fed state. Spacing meals gives your body time to digest, use and store what has arrived.

7.4 Model answer: Timing: the two meals were breakfast and lunch, while the six were spread across the day. Meal number and time of day changed together, so the trial supports the tested pattern (fewer, earlier meals) but can't separate the two. Both groups ate the same reduced calories, so the deficit doesn't explain the difference.

7.5 Supports: 16:8 was a workable way to lose weight without counting calories, with an HbA1c benefit similar to calorie restriction, and most people stuck to it. Doesn't support: that time-restricted eating necessarily gives better glucose control, or that it suits everyone. The chapter notes that the differences between methods are not large in well-controlled trials. Mark: one of each.

7.6 Model answer: Working muscle takes up glucose by a route that doesn't depend on insulin (GLUT4, Chapter 2). Walking just after a meal puts that uptake to work while meal glucose is arriving. Reynolds found three post-meal walks beat one 30-minute walk at another time, with the biggest effect after dinner, when insulin sensitivity is naturally lower. The longer walk still has value.

7.7 Talk to their diabetes healthcare team first. Changing how much and when you eat changes how some medicines act and can raise the risk of low blood glucose, so the plan and the medicines may need adjusting together. The chapter asks this before any pattern that skips meals or extends the overnight fast.

7.8 Model answer: No. She could keep clear gaps between meals and stop grazing; choose a regular eating window anchored to her shifts rather than the clock; take a short walk after her main meals; and keep her largest meal in the earlier part of her waking day where she can. The best pattern is one she can live with, agreed with her healthcare team if she takes glucose-lowering medicine. Mark: two workable adjustments.

Marked questions right: ____ out of 8 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading the section Layer 4: Use timing and spacing to your advantage.

8 Protect the whole plan

About 15 minutes
Close the book first

Chapter sections: Layer 5: Keep the plan safe, sane and sustainable · Plan to beat the plateau

Layer 5 is quality control. Then, how to tell a real plateau from a flat week.

8.1 Farah's glucose readings improve on a diet heavy in fatty meat, butter and cream, but her LDL cholesterol rises markedly and her fibre intake collapses. Is this a good plan by the standards of Chapter 7? ● ● ● ○ ○ CONNECT S U G

8.2 Match each situation to the nutrition point it raises. Write the letter in the box. ● ● ○ ○ ○ UNDERSTAND S U G

Situation	Nutrition point
□ Taking metformin long term	A. Omega-3 (EPA and DHA) backup
□ Kidney disease, or medicines that affect potassium	B. A broad-spectrum multivitamin
□ Rarely or never eating oily fish	C. Have vitamin B12 checked
□ Running a substantial calorie deficit	D. Speak to your doctor before raising potassium

8.3 Which does the chapter treat as a warning sign to adjust the plan, not a reason to try harder? S U G

● ● ○ ○ ○ UNDERSTAND

○ A losing 1 kg in one week
○ B dreading social meals, hiding eating
○ C hunger before dinner
○ D a small gain in a maintenance phase

8.4 Your weight has been the same for six days, but your weekly averages are still falling and your waist is smaller. Has fat loss stopped? ● ● ● ● ○ APPLY S U G

8.5 For several weeks, your weekly average weight and your waist have stopped changing, though you feel you have stuck to the plan. Name three things to check before cutting food further. S U G

● ● ● ● ○ APPLY

8.6 Weight loss usually slows. Match each description to its name. ● ● ○ ○ ○ UNDERSTAND S U G

Description	Name
□ A lighter body needs less energy to run and move	A. Adaptive thermogenesis
□ Fewer trips upstairs, less fidgeting, slightly slower walking	B. Lower average energy needs of leaner people
□ Energy use falls further than the new body size predicts	C. NEAT (non-exercise activity thermogenesis)

8.7 Both MATADOR groups spent 16 weeks in a calorie deficit, but the planned-break group spread theirs over 30 weeks. Why is it misleading to say, “Diet breaks make everyone lose 55% more weight in the same time”? ● ● ● ○ ○ CONNECT S U G

8.8 A friend says: “I'm taking a MATADOR break: two weeks of eating whatever I like to reset my metabolism.” Correct this in two short sentences. ● ● ● ● ○ APPLY S U G

Turn the page to check your answers.

8 Protect the whole plan

Mark each question ✓, ½ or ✗

8.1 No. A plan that lowers glucose while raising LDL cholesterol (or ApoB), stripping out fibre or making eating a source of tension is badly designed. The safer foundation is lean proteins, oily fish, vegetables, legumes, fibre-rich foods and unsaturated fats in place of saturated ones. She should discuss the result with her clinician rather than ignore it.

8.2 Metformin C · Potassium D · Oily fish A · Deficit B These are points to raise with your healthcare team, not a supplement shopping list. Mark: three of the four.

8.3 B. Hiding eating and dreading social meals are among the chapter's warning signals, along with persistent rebound eating, obsessive food thoughts, exhaustion, feeling cold, altered sensation and poor sleep. They call for a review: is the deficit too aggressive, the food volume too low or the plan mismatched to your life? Ordinary hunger (C) and a small, mostly water gain during maintenance (D) are expected.

8.4 No. One flat week tells you very little; water, glycogen and food moving through your gut can hide fat loss. A genuine plateau means several weeks with no fall in weekly average weight, no change in waist and honest adherence. Here, two of those three suggest progress is continuing.

8.5 Any three of: oils, sauces, milky drinks and handfuls of nuts; 'just one bite' moments and portion creep; missed walks and less daily movement; alcohol; late nights and poor sleep; and whether your smaller body now needs less energy (Chapter 8 shows how to recalculate). Most plateaus contain at least one of these. Mark: three sensible checks.

8.6 Lighter body B · Fewer movements C · Beyond prediction A The Biggest Loser follow-up showed an extreme case of adaptive thermogenesis, years later. It is not typical, but it shows why planned maintenance may help. Mark: all three.

8.7 Model answer: The groups spent the same time restricting, not the same calendar time: the break group took 30 weeks, the continuous group 16. It was one trial, in men with obesity, and averages are not guarantees. A fair reading: for the same weeks of restriction, planned breaks gave more weight and fat loss and a smaller fall in adjusted resting metabolic rate (about 86 against 179 kcal a day).

8.8 Example: "A maintenance break means eating sensibly at about your maintenance calories, not eating whatever you like; in MATADOR, weight barely changed during the breaks. It may ease diet fatigue and reduce some slowing of metabolism, but it isn't a permanent reset."

> FROM ANDREW
>
> *Plateaus are where many people give up, often after a flat week or two that turns out to be noise. Diagnose first, then adjust. And a planned maintenance phase is a tool you choose, not an admission of failure.*

Marked questions right: ____ out of 8 Sure but wrong: ____ (redo these after a day or two)

Several wrong? Try this set again in a day or two, after rereading the sections Layer 5: Keep the plan safe, sane and sustainable and Plan to beat the plateau.

9 Join it all up

About 20 minutes
Close the book first

Draws on the whole of Chapter 7.

Everything mixed together, as you will meet it in real life. Expect this set to be the hardest.

9.1 Find the layer. Which layer most needs attention first in each case, and why? Several layers can help, so give a reason for your first choice. ● ● ● ● ○ APPLY S U G

Case	Layer	Why
a. Meals much smaller, protein low, weakness growing		
b. Weight falling slowly; unplanned delivery most evenings		
c. Scale flat for nine days; weekly average fasting glucose still falling		
d. Glucose down, but tired, little fibre, LDL rising		

9.2 Spot the errors. Gary has found a new influencer. Find at least five of the seven mistakes, and correct them. ● ● ● ● ○ APPLY S U G

> *"I cut out carbs and my glucose spikes fell at once, which proves keto has cleared the fat from my liver. Weight loss is irrelevant, so I replace every carb calorie with cream and butter. Walking is pointless because exercise only burns calories. I don't need to check my cholesterol while my glucose looks good. And every kilo I lose is pure fat."*

9.3 Match each study to its finding. Write the letter in the box. ● ● ● ○ ○ CONNECT S U G

Study	Finding
□ Kanbour et al.	A. Similar average weight loss on healthy low-fat and low-carb diets
□ DIETFITS	B. Three short walks after meals beat one longer walk at another time
□ Hall, 2019 study	C. Planned maintenance breaks: more fat lost for the same weeks of restriction
□ Reynolds	D. Weight loss was by far the strongest predictor of remission
□ MATADOR	E. About 500 kcal a day more eaten on an ultra-processed menu

9.4 Look ahead. Chapter 8 asks you to choose how hard to push your deficit. Using this chapter, predict one advantage of a bigger deficit and one risk. ● ● ● ● ● LOOK AHEAD S U G

9.5 Design a plan. Pat likes familiar food, gets hungry at night, hates counting calories and wants to stay strong. Give one action for each of Layers 1–4 and one check for Layer 5, saying what each does. ● ● ● ● ○ APPLY S U G

Layer 1	
Layer 2	
Layer 3	
Layer 4	
Layer 5	

9.6 Explain it to a friend. "I have type 2 diabetes. Why can't I just find the one perfect diet?" Answer in about six sentences, on a spare sheet or aloud, explaining any technical word you use. ● ● ● ○ ○ CONNECT S U G

Turn the page to check your answers.

9 Join it all up

Mark each question ✓, ½ or ✗

9.1 a Layer 2: supply and loading are both failing, and Layer 5 too, since growing weakness is a warning signal.
b Layer 3: the food environment, especially choice and availability; plan the evening meal in advance.
c Nothing to fix: by Layer 5's plateau test this isn't a plateau yet.
d Layer 5: lower glucose doesn't make up for rising LDL, low fibre and exhaustion. Mark: three of the four, with reasons.

9.2 Corrections:
1 A smaller spike here shows less carbohydrate arriving, not that liver fat has cleared.
2 Keto diets are not required for remission and this is not proof of superiority.
3 Weight loss is **by far** the strongest predictor of remission.
4 Replacing carb calories with equal fat calories leaves no deficit, so organ fat largely stays.
5 Exercise also helps muscle take up glucose and protects muscle.
6 LDL cholesterol and wider health count, whatever the glucose readings.
7 Some lost weight is lean tissue unless you protect it.
Mark: five or more; ½ for three or four.

9.3 Kanbour D · DIETFITS A · Hall E · Reynolds B · MATADOR C For a deeper test, take any one and say what it does not prove. Mark: four of the five.

9.4 Not marked. Likely answers: Advantage: faster fat loss, with liver fat and the floor falling quickly. Risks: more muscle loss (crash dieting makes it worse), more hunger, more chance of warning signals such as exhaustion and obsessive food thoughts, and a plan that is harder to sustain. Chapter 8 helps you weigh this for your own circumstances.

9.5 One good plan: 1 A modest, steady deficit using familiar meals in slightly smaller portions. 2 Protein in each main meal and regular resistance work, for strength. 3 High-volume, lower-energy foods and a planned rescue snack for evenings. 4 Close the kitchen after dinner and take a short walk after it. 5 Watch strength, energy, sleep and blood results, and discuss medicines with the healthcare team. Many other plans are right if each action does a clear job. Mark: five sensible actions, each with a job.

9.6 Example: Different diets just change what, when and how much you eat, so the label counts for less than whether you can keep it up. Eating less carbohydrate shrinks the rise in glucose after meals, the spike, while losing excess fat from the liver and pancreas lowers the level between meals, the floor. Eating a little less energy than you use, over months, is what drains that fat. Enough protein and regular muscle work protect your muscles while you lose weight. Filling, familiar meals and a sensible routine make it easier to stick to. The right plan improves your glucose without harming your strength, nutrition or wider health.

Marked questions right: ____ out of 5 Sure but wrong: ____ (redo these after a day or two)

SPACED REVIEW

Return ticket

Use this page twice, after a gap each time

Memory fades fastest in the first few days, and each successful recall after a gap slows the fading. Come back to this page a day or two after finishing the sets, then again about a week later, wherever you have got to in the book. There are no answers here. Answer from memory, tick the round, then check against the answer named.

	Question	First return	Second return
R1	Name the three levers every diet pulls on. See 1.2	☐	☐
R2	What mainly sets the spike, and what mainly sets the floor? See 2.1and 2.3	☐	☐
R3	Which change can lower fasting glucose within days of a strict deficit? See 3.2 and 3.3	☐	☐
R4	Name the three pressures on muscle in a deficit, and the countermeasure for each. See 4.3	☐	☐
R5	What does Hall's 500 kcal a day show, and what doesn't it show? See 6.4	☐	☐
R6	Why can three 10-minute walks after meals beat one 30-minute walk? See 7.6	☐	☐
R7	How do you tell a real plateau from a flat week? See 8.4	☐	☐
R8	How is a maintenance break different from a cheat week? See 8.8	☐	☐
R9	Three-minute brain dump: close the book and, on a blank sheet or aloud, recall everything you can from Chapter 7. Then compare it with your first attempt to see how much more you can now recall. See 1.1	☐	☐
R10	In 90 seconds, aloud, explain how the five layers work together. See 9.6	☐	☐

Can you do these without the book?

- ☐ I can classify any diet by the levers it pulls.
- ☐ I can explain the spike and the floor, and what sets each.
- ☐ I can explain why less carbohydrate alone may not lower the floor.
- ☐ I can say what improves early in a deficit and what takes longer.
- ☐ I can explain why muscle is lost in a deficit and how to protect it.
- ☐ I can use energy density, fibre, meal order and pace to make meals more filling.
- ☐ I can explain the three 'hypers' and why a meal rotation helps.
- ☐ I can say what meal spacing, timing and post-meal walks each do.
- ☐ I can tell an apparent plateau from a real one, and say what a maintenance break is.

FROM ANDREW

No single layer carries the whole plan. The deficit drains the fat; the other four keep it working, bearable and safe. When something stalls, the layers give you somewhere specific to look instead of starting again from scratch. Chapter 8 turns these principles into your own numbers. Any box you couldn't tick points to the set to revisit first.