The Principles of Diabetes-Reversing Diets

Read it before the workbook, or after it as a quick review

Start from the mechanism, not from a list of allowed foods. These principles let you adapt when life gets in the way.

1 Only three levers

Every diet that works for diabetes reversal pulls on some mix of three **levers**: **what** you eat, **when** you eat and **how much** you eat. Low-carb and plant-based diets pull on *what*; time-restricted eating pulls on *when*; calorie counting pulls on *how much*. The Mediterranean diet pulls gently on several, while **total diet replacement** (complete shakes and soups in place of meals) pulls hard on *what* and *how much*. You are not choosing between rival belief systems. You are choosing which levers you can pull consistently for the months it takes to clear the excess fat from your liver, pancreas and muscle and bring your glucose floor down.

2 What the trials tell us

Kanbour and colleagues brought together 22 publications of randomised trials in type 2 diabetes, covering low-carb and low-fat diets, intermittent fasting, total diet replacement and surgery. One factor stood out as by far the strongest predictor of remission: how much weight people lost. Once that was accounted for, age, starting weight, HbA1c, diabetes duration, insulin use and type of diet showed no clear independent link.

The **DIETFITS** trial put 609 adults on a healthy low-carb or healthy low-fat diet for a year. Average weight loss was the same, and so were the improvements in glucose control and insulin sensitivity. Within each diet, results ranged from losing 30 kg to gaining weight. The winners on both sides were the people who found their diet workable enough to keep going, not those who landed on an “ideal” diet. And a 2022 analysis by Hosseini and colleagues found no clear, strong link between total carbohydrate intake and later diabetes, which doesn't make carbohydrate quality irrelevant.

> *The method you choose counts for far less than how well you stick to it. You don't need to fear any macronutrient or cut out whole food groups: you can reach remission with ordinary food you already enjoy, adjusted to create an energy deficit.*

3 The spike and the floor

Blood glucose has two layers. The **spike** is the rise after a meal, driven mostly by carbohydrate. The **floor** is the level glucose settles to between meals and overnight. Glucose comes from two sources: **external** (food) and **internal** (mainly the liver). The spike's size depends on how much glucose the meal delivers, how well insulin turns down the liver's own output and how fast muscle clears glucose, so losing the first-phase insulin burst and muscle insulin resistance make spikes higher and longer. The floor depends mainly on how much glucose the liver releases when no food is arriving, and how well insulin restrains it. Fat in the liver, weakened beta cells, stress hormones and body-clock disruption all push the floor up. That is a problem of regulation, so cutting carbohydrate at dinner can't fix it alone.

Like a high tide, a raised floor lifts the whole day's glucose profile. Big spikes add exposure too, and very high ones can be dangerous. Remission is judged mainly by **HbA1c**, which reflects glucose exposure across the whole day and night, so bringing the floor down is central. Figure 7.1 shows three cases: a high peak and floor; a lower-carb meal with a smaller peak but the same high floor; and, after fat loss, a lower floor with a moderate, manageable peak.

4 Low-carb, keto and fruit

Low-carb eating shrinks the spike, which is a real benefit, and fasting glucose may improve early. But for lasting remission it must also create the **energy deficit** that drains visceral and ectopic fat. Swapping carbohydrate calories for the same calories of fat can flatten spikes without touching the fat underneath. Some people find low-carb eating very satisfying; others feel hungry and restricted. A **ketogenic** diet, low enough in carbohydrate that the liver makes large amounts of **ketones** from fat, is not required, and being in **ketosis** is not proof the problem is fixed. A normal mixed diet works just as well if it helps you sustain a deficit.

Concentrated sugars (table sugar, syrups, honey, juice, dried fruit, sugary drinks and sweets) are easy to consume in large amounts with little fibre or bulk. Their glucose drives the spike, while their fructose goes mainly to the liver, where large, repeated amounts in a surplus feed fat-making. Cut these hard. **Whole fruit** is different: its sugar comes inside water, fibre and cell walls that slow eating and digestion, which is why two apples fill you in a way a small glass of apple juice (about the same sugar) doesn't. Grapes, mangoes and ripe bananas carry more than berries or citrus. Favour whole fruit, keep portions of sweeter fruit sensible and let your readings guide you.

5 The five layers

Layer	Name	Job
1	Drain the visceral and ectopic fat	The engine of reversal
2	Protect the future you	Keep your muscle
3	Outwit hunger	Make the deficit bearable
4	Use timing and spacing	Tilt the system your way
5	Keep it safe, sane, sustainable	Quality control

6 Layer 1: Drain the fat

An **energy deficit** means taking in less energy than your body uses, sustained over weeks and months. Its power is that it reverses the direction of fuel traffic, from storage towards using stored fuel. The liver responds first: Lim and colleagues found liver fat falling within days of strict restriction, with the liver quickly becoming more sensitive to insulin and releasing less glucose, so the floor can fall before much weight comes off. Muscle insulin sensitivity improves as the fuel overload eases. Pancreatic fat falls over the following weeks and months and beta-cell function can return, though recovery varies and tends to be greater earlier in diabetes. After weight-loss surgery, glucose often improves within days, yet matched very-low-calorie diets without surgery produced the same early gains: in that research, 80–90% of the eventual fall in fasting glucose came in the first ten days of severe restriction. Figure 7.2 shows this rough order of improvement.

7 Layer 2: Protect the future you

Weight loss is not pure fat loss. Muscle protein is constantly turning over: **breakdown** runs steadily, while **muscle protein synthesis** rises in pulses after protein-rich meals and after muscle challenge. Picture a block on a gentle slope, always sliding down and pushed back up several times a day. An energy deficit makes the slope steeper in three ways:

Supply. Fat stores energy, not amino acids. Every protein in the body needs a steady supply, the liver also uses some to make glucose, and the only sizeable reserve is muscle. Signalling. Muscle cells sense when energy is scarce and turn synthesis down; cutting energy by 20–30% can reduce it within days. **Leucine**, an essential amino acid, acts as a “nutrients on board” signal with a **threshold-like effect**: below a certain amount the response falls away sharply. Loading. A lighter body and less activity tell muscle it is less needed.

Left alone, about a quarter of the weight a typical “just eat less” dieter loses may be lean tissue, more with crash dieting or when there is little fat to lose. The countermeasures: enough **total daily protein** (first priority; Chapter 8 sets your target), good **protein quality**, and protein spread across the day, aiming for about 2–3 g

of leucine in two or three main meals (if only two, the first and last); plus **resistance training**. Protein is also the most filling macronutrient. The **protein leverage hypothesis** (Raubenheimer and Simpson) suggests that when protein is diluted by fat and carbohydrate, as in many ultra-processed diets, appetite keeps pushing until protein needs are met, so total energy rises. Add lean protein to familiar meals: chicken in soup, boiled eggs, tofu, Greek yoghurt or cottage cheese.

8 Layer 3: Outwit hunger

Energy density, the calories per gram of food, is the most useful tool. Stretch sensors in your stomach signal fullness as it fills. About 500 kcal of boiled potato is roughly 600 g, a plateful taking 15 minutes to eat; 500 kcal of cashews is about 80 g, a handful gone in two minutes and followed by a nagging urge for more. **Fibre** helps too: **soluble fibre** forms a gel that slows glucose absorption and prolongs fullness, **insoluble fibre** adds bulk and **fermentable fibre** feeds gut microbes. **Meal order** counts too: eating protein and non-starchy vegetables before the starchy part of the same meal cut the after-meal peak by around 30% in studies using identical foods. **Eating pace**: fullness signals take time, which is why competitive eaters start fast. Put your fork down between bites, or serve half the meal and pause, and make meals last well over 20 minutes.

Neil, running a real deficit, sometimes got intense ordinary hunger and once wrote off a whole week after eating most of a baguette. He kept big, filling, lower-energy **rescue foods** to hand (skyr, popcorn, cottage cheese and crackers) and realised one hard afternoon is a rounding error in a plan that runs for months. Shaky, sweaty or confused feelings are different: they can mean low blood glucose and must not be ignored.

Natural food has a **food matrix**, a layered structure that slows eating and digestion. Many **ultra-processed foods (UPFs)** have lost it, along with fibre and water, and are made denser, faster to eat and more moreish. In Hall's 2019 study, 20 adults on a metabolic ward ate an ultra-processed and a minimally processed diet for two weeks each, matched for calories, sugar and fat offered. They ate about 500 kcal a day more on the UPF diet and gained weight, but lost weight on the other. The modern food environment adds **hyper-novelty** (constant new products sparking desire), **hyper-choice** (endless options that keep you comparing) and **hyper-availability** (food at your door in minutes). The antidote is a **low-stimulation meal rotation**: a small set of enjoyable, familiar meals on repeat, a weekly shop from a list and the same good choices when eating out. Not “monk mode”: just “Just the usual?”

9 Layer 4: Timing and spacing

Grazing keeps glucose and insulin raised and you in the fed state all day. In Kahleova's **crossover trial**, 54 people with diabetes ate 500 kcal below their needs as two early meals or as six meals, 12 weeks each. The two-meal breakfast-and-lunch pattern gave more weight loss, more liver-fat loss and lower fasting glucose. Insulin sensitivity is better earlier in the day: Jakubowicz found that eating more at breakfast than at dinner lowered glucose after meals. Closing the kitchen after dinner helps both your biology and your evenings.

Time-restricted eating (TRE) limits eating to a daily window. In **16:8**, you go 16 hours without food, including sleep, then eat within 8 hours; the window can be adjusted, and it is not a licence to overeat. In Pavlou's trial (noon to 8 p.m., no counting), TRE gave 3.6% weight loss against 1.8% with calorie restriction, with similar HbA1c falls and high adherence. A **5:2** pattern eats normally for five days and much less on two; Carter found about the same HbA1c fall as daily restriction over a year. Always discuss any pattern that skips meals or extends your overnight fast with your medical team first, especially if you take medication. Differences between methods are small in good trials, so use a pattern you are happy with.

Movement after meals lets working muscle take up incoming glucose. Reynolds found three 10-minute walks after meals beat one 30-minute walk at another time, with the biggest effect after dinner. An easy start: stop snacking, move your last meal a little earlier and walk for 10 minutes after dinner.

10 Layer 5: Safe, sane and sustainable

Eating less means fewer **micronutrients**, so a daily broad-spectrum multivitamin is reasonable insurance during a substantial deficit. Five nutrients deserve attention: **vitamin D**; **magnesium** (take care with kidney disease); **vitamin B12**, which long-term metformin lowers, so get it checked; **potassium**, best from food, but speak to your doctor first because some conditions and medicines affect it; and **omega-3** (EPA and DHA), from oily fish or a supplement if you rarely eat it. Check details with your healthcare team.

A plan that lowers glucose while raising **LDL cholesterol** or **ApoB**, raising blood pressure, stripping out fibre or creating tension at home is badly designed. The safer foundation is lean proteins, oily fish, vegetables, legumes, fibre-rich foods and unsaturated fats in place of saturated ones. Also watch triglycerides, energy, mood, strength, sleep and whether eating still feels normal. **Warning signals** include rebound eating, obsessive food thoughts, hiding eating, dreading social meals, constant tiredness or cold, cramps or tingling, poor sleep and tension at home. They are signs to adjust, not to try harder: the deficit may be too aggressive, the food volume too low, the eating window too narrow or the plan a poor fit for your life. Easing up or a short break is not failure.

11 Plan to beat the plateau

Weight loss usually slows. A lighter body needs less energy. **NEAT** (non-exercise activity thermogenesis: fidgeting, stairs, pacing) falls without you noticing. And **adaptive thermogenesis** can lower energy use more than the new size predicts. Portion drift, hidden calories, stress, poor sleep and constipation add to the picture. One flat week tells you little: a **true plateau** is several weeks with no fall in weekly average weight or waist, despite honest adherence. First check the dull things: oils, sauces, milky drinks, handfuls of nuts, “just one bite”, missed walks, alcohol and late nights. In the extreme case, 14 contestants from *The Biggest Loser* still had a resting metabolic rate about 500 kcal a day lower than expected six years later.

A **planned maintenance phase** is a short, deliberate return to about maintenance calories, eating sensibly, not a cheat week. Any small gain is mostly water, glycogen and food in the gut. In the **MATADOR** trial, men with obesity either dieted for 16 weeks straight, or did the same 16 weeks as eight two-week blocks with two-week maintenance breaks (30 weeks in all), at about 33% below maintenance. The break group lost 14 kg against 9.1 kg, and 12 kg of fat against 8 kg, with weight flat during the breaks. After allowing for body composition, their resting metabolic rate fell by about 86 kcal a day against 179. Chapter 10 turns this into a “press, ease, repeat” rhythm.

12 From principles to plan

Other dietary details exist, but in most circumstances they make marginal difference and mostly distract, with promises that will “revolutionise your health”. Keep it ordinary and put your energy into what does most of the work. Next, Chapter 8 turns these principles into your own calorie and protein targets.

JOINING IT UP

Choose levers you can keep pulling. Create a sustained deficit to drain the fat, which lowers the floor as well as the spike. Protect your muscle with protein and resistance work. Make meals filling and your food environment calm. Use spacing, earlier eating and walks after meals to tilt the odds. And check that the whole plan keeps you healthy and is one you can live with.