deandradejd@gmail.com 14 Aug 2026

SOLOMON'S GUIDE TO FAT LOSS



Lose fat efficiently and keep it off forever

SOLOMON NELSON

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Foreword

by Lyle McDonald

I first met Solomon Nelson a few years ago when he approached me about making some video content with him. Recognizing my inherent laziness, he realized that the key was to just get me to talk for hours and then do all the editing and other backend stuff himself. This realization puts him above most.

He and I hit it off immediately and, for good or for bad, I saw a lot of younger me in him. He was exceedingly evidence and fact based, detail oriented and just a little bit obsessive (though perhaps not in the same, arguably unhealthy, way I was in my younger years). It was little to no shock that we got along as well as we did.

For those who don't know who I am, I've been in the fitness industry for over 30 years. To a first approximation, definitely for good or for bad, I created the online evidence-based industry. By that I mean that I was the first really pushing science into a field littered mostly with lore and nonsense.

Over my career I've authored 15 books on various topics, mostly related to nutrition and fat loss. And during that time,

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I've often ‘joked’ that my job is to turn the ideas of eat less, exercise, repeat forever into a 300-page book. It’s not much of a joke of course even if most diet books do it with 150 pages of nonsense and 150 pages of food lists and recipes.

But the trite advice to eat less, exercise, and repeat forever is meaningless no matter how much it is said. Because the devil is in the details. There are a lot of ways to eat less, many of which do more harm than good. Exercise is a perpetual source of confusion. And of course, the repeat forever, long-term maintenance of fat loss has always been the difficult bit.

Which brings me to Solomon’s book. Because in its 516 pages it has taken those three simple concepts and gone into the details. How much to eat. Which nutrients and what types of foods to eat (and he does include recipes at the back but certainly not 150 pages worth) along with how to stay full on a diet. Diet breaks, different types of energy restriction are all discussed in detail as well. He addresses the different types of exercise, what’s good, mandatory or even potentially negative. Sleep, often forgotten, gets its own chapter. Rightfully, supplements are addressed only briefly since they represent the top of the pyramid, only important after everything else is in place. The book ends, rightfully, with a detailed chapter on how to achieve long-term maintenance.

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Although it only represents a small percentage of dieters, he addresses peaking for a physique show as well.

But that just scratches the surface of his book. Throughout he provides endless practical advice on determining how much and what to eat, shopping, little heuristics and tricks for tracking progress and not getting derailed as happens to so many. References are also provided for the 6 nerds who will look them up.

And there's so much more. In his book, Solomon has broken down three meaningless sentences into a comprehensive tome on the topic of successful long-term fat loss. While I can't say that following his advice will guarantee your success (anybody who does is lying to you), I will say that if you read, follow and apply what he has written in this book, you will be doing everything in your power to improve your chances exponentially.

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Chapter 1. Introduction

‘So, what’s the best way to lose fat?’

This is the question that I am most often asked in private consultations. It is also the central question of this book.

I have always enjoyed discussing fat loss with my clients. But between handling the rapid growth of my YouTube channel and the increasing demands of law school, I reached a limit on the number of people that I could personally work with. Supply and demand inevitably drove my rates up, creating a dilemma: the people who needed clarity the most were being priced out. This bothered me, because I never set out to create a luxury service for the few. I set out to help as many people as possible.

This book is my attempt to solve that problem.

It is an attempt to scale up my impact and democratize the information that I have spent years refining. I have taken everything that I know about fat loss—the specific protocols and troubleshooting strategies that I use with private clients—and have distilled it into this volume.

Think of this book as a consultation you can revisit whenever you need it. The chapters follow the same

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progression that I use when consulting someone one-on-one. We begin with philosophy. We first interrogate your underlying motivations, asking why you are choosing to lose fat in the first place, because putting yourself through the rigours of a fat-loss phase requires a clearly defined and defensible reason.

Once the objective is defined, we move to the fundamentals: the physics and biology that govern fat loss whether you believe in them or not.

From there, we move into application. You will learn how to design a training and eating plan that preserves muscle while shedding fat. You will learn how to track progress accurately and how to adjust when the rate of loss slows.

However, fat loss is lived in kitchens, restaurants, offices and social environments. Adherence is challenged by stress and daily obligations, as well as physiological factors such as hunger and fatigue. That is why much of this book is dedicated to behavioural strategy; e.g., volume eating, maintenance days and diet breaks.

Finally, we will address the part of dieting that almost no one teaches properly: maintenance. Losing fat is one skill. Keeping it off is another. You will learn how to transition out

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of a deficit and stabilize your new body composition so that you can break the cycle of yo-yo dieting permanently.

Because this book is designed as a comprehensive resource, it is also inherently modular. If you are already well-versed in the underlying biology and are impatient for the meat and potatoes of calculating your deficit or structuring a training program, then feel free to skip ahead. You do not need to read this cover-to-cover if a specific section does not serve your immediate goals. Simply take what is useful for your current phase and bypass what you already know. To facilitate this, I have included a list of key takeaways at the close of every chapter. If you are short on time and want to skim a chapter's core arguments, or if you simply need a refresher on a specific concept, then those summaries are there for your convenience.

My goal is simple: by the time you finish this book, you should never need to hire a coach to explain fat loss to you again. You should understand the 'why' and the 'how' so thoroughly that you can evaluate any diet, any claim, any trend, and immediately know whether it is legitimate or nonsense.

My fat-loss protocols may at times feel like a shortcut, but only because the broader fitness industry has normalized flaccid dieting conventions that are inefficient and hard to

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follow. Without mystery or obscurity, the information ahead will give you the necessary control over your physiology; it is the same control that my clients pay a premium for. The only difference is that now it is yours.

Let us begin.

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Chapter 2. Why lose fat, anyway?

Just because you can lose fat does not necessarily mean that you should. This chapter will contend that before you endure the hunger, the lethargy and the social strain that effective dieting often causes, you need a good reason. In a cultural moment that is increasingly—and often rightly—critical of diet culture, and which increasingly champions the acceptance of all body types, the decision to starve oneself voluntarily (even in a controlled and optimal manner) requires a defence. It requires a philosophy. Before building your meal plan or calculating your macronutrients, we need to clarify your intent. Your 'why' has to be strong enough to override your physiological and psychological impulses. Without this, the information in the following chapters will remain abstract and hypothetical. You cannot successfully apply the principles that I will outline if your rationale for doing so is weaker than your hunger.

The decision to alter your body composition is an exercise in autonomy, a rejection of the idea that your shape is simply a matter of genetics or luck. It is the assertion of the will over the biological self. But this assertion has to be grounded in reality. There are generally three valid domains of motivation for fat loss: aesthetics, health and performance. We will examine each with an unsparing eye.

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2.1. Aesthetics

Let us begin with the most common, yet most shame-laden motivator: aesthetics. It has become fashionable to pretend that we diet solely for wellness or longevity, masking our vanity in the language of medicine. There are some people who are motivated purely by medical principles, but they are very few and I am yet to meet one. Most of us find it gratifying that there are medical benefits in an aesthetically satisfying physique; but this happy consequence is seldom the primary aim. The desire to look a certain way—to see definition in the abdominals, separation in the deltoids, vascularity in the forearms or a specific silhouette in the mirror—is a valid expression of personal preference. Humans are visual and tactile creatures, and the cultivation of the physique has been a central theme of art and culture from the marble sculptures of Greek antiquity to the stages of modern bodybuilding.

If we are willing to be uncomfortably precise, then we can even look to data for coordinates. Evolutionary psychology and attractiveness research have attempted to quantify the ideal. For men, research points toward a Body Mass Index (BMI) of roughly 23 to 27 as the most visually appealing, ideally accompanied by a low waist-to-chest ratio (the

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coveted V-taper).[1] For women, Western standards often trend lower, with research citing a BMI between 19 and 20 as the theoretical peak of conventional attractiveness, often linked to a specific waist-to-hip ratio of 0.7.[2]

While BMI is a blunt instrument that cannot distinguish between marble and clay—a BMI of 25 can look overweight on a sedentary office worker, yet heroic on a natural bodybuilder—these numbers provide a directional compass. If your current metrics sit considerably above these ranges, and that deviation is driven by adipose tissue (fat mass) rather than muscle mass, then the uncomfortable truth is that moving closer to these coordinates will likely enhance your conventional attractiveness.

There is a unique satisfaction in the sculptural aspect of bodybuilding and fat loss. Unlike a painter who works on

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[1] Maisey, D. S., Vale, E. L., Cornelissen, P. L., & Tovée, M. J. (1999). Characteristics of male attractiveness for women. *The Lancet*, *353*(9163), 1500. https://doi.org/10.1016/S0140-6736(99)00438-9; Xia, F., Sauciuvenaite, J., Bissland, R., Hambly, C., Starr-Vaanholt, L., Faries, M. D., Wang, G., & Speakman, J. R. (2025). The relationship between body fatness and physical attractiveness in males. *Personality and Individual Differences*, *243*, Article 113240. https://doi.org/10.1016/j.paid.2025.113240

[2] Singh, D. (1993). Adaptive significance of female physical attractiveness: Role of waist-to-hip ratio. *Journal of Personality and Social Psychology*, *65*(2), 293–307. https://doi.org/10.1037/0022-3514.65.2.293; Tovée, M. J., Maisey, D. S., Emery, J. L., & Cornelissen, P. L. (1999). Visual cues to female physical attractiveness. Proceedings of the Royal Society of London. Series B: *Biological Sciences*, *266*(1415), 211–218. https://doi.org/10.1098/rspb.1999.0624

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canvas or a lawyer who crafts arguments, the bodybuilder works on the self. As Arnold Schwarzenegger is credited as saying, you are both the sculptor and the clay. Losing fat for aesthetic reasons is effectively a process of revealing the work that you have done in the gym. It is removing the surplus marble to reveal the statue. If your motivation is to look better naked or to fit into a specific suit, then it is more than fair to own that desire. You do not need to apologize for it.

For those who lift, a key element of the aesthetic formula is that fat loss equates with the visibility and tangibility of muscle. It is pleasing to see that the development of the deltoids or quadriceps is conspicuous, whereas it is slightly demoralizing if all of the hard work with weight training is hidden beneath a layer of adipose tissue. It follows that shedding fat has twice the reward for anyone engaged in resistance training. It is hugely motivating for both the exercise regime and the cut, because the results of the one spill into the results of the other. A person who seeks to lose fat simply by eating less is deprived of that synergy. Those who lift, on the other hand, can find inspiration in the direct link between fat loss and the muscular aesthetic. Those who lift have a total project in hand, where fat loss and weight training make one another more rewarding and psychologically sustainable.

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However, you should also recognize where the pursuit of fat loss for aesthetic purposes reaches a point of diminishing—and eventually, negative—returns. The body fat ranges generally considered most attractive do not entail contest leanness.[3] If your personal aesthetic demands being genuinely shredded, then you should analyse the costs and benefits of maintaining that state very carefully. Beyond the fact that you will likely appear less attractive to the general public than you would at a healthier body fat percentage, the systemic toll of extreme leanness is severe, as discussed in the next section. Unless your physique is inextricably tied to your livelihood, you are likely far better served by embracing a more sustainable, comfortable body fat percentage.

2.2. Health

The second domain is health. This is the most socially acceptable reason to diet, yet it is also the most frequently misunderstood. We must be precise here. Fat is not inherently a disease, nor is thinness inherently a cure. However, the accumulation of excess adipose tissue—specifically visceral fat, which wraps around the internal organs—is unequivocally linked to a cascade of negative metabolic outcomes, including insulin resistance,

[3] Brierley, M.-E., Brooks, K. R., Mond, J., Stevenson, R. J., & Stephen, I. D. (2016). The Body and the Beautiful: Health, Attractiveness and Body Composition in Men's and Women's Bodies. *PLOS ONE*, *11*, e0156722. https://doi.org/10.1371/journal.pone.0156722

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systemic inflammation, dyslipidaemia and cardiovascular strain.[4] For a person carrying significant excess body fat, the decision to diet is a literal reclaiming of life expectancy and vitality.

Yet, we must apply a critical lens here as well. The relationship between weight and health is a J-curve.[5] There is a point of diminishing returns, and eventually, a point of negative returns. The health argument begins to collapse when an already lean person attempts to diet down to essential body fat levels. A male natural bodybuilder on stage at 5% body fat—or a female natural bodybuilder at 10 to 12%—is not healthy. Physiologically, they can expect a crash in sex hormones—often manifesting as zero libido or amenorrhea (the cessation of the menstrual cycle)—alongside thyroid down-regulation, chronically elevated cortisol, insatiable hunger, fragmented sleep and a heightened risk of injury. Psychologically, they can expect obsessive food focus, brain fog, irritability and a heightened

[4] Després, J.-P., & Lemieux, I. (2006). Abdominal obesity and metabolic syndrome. *Nature*, *444*(7121), 881–887. https://doi.org/10.1038/nature05488

[5] Aune, D., Sen, A., Prasad, M., Norat, T., Janszky, I., Tonstad, S., Romundstad, P., & Vatten, L. J. (2016). BMI and all cause mortality: Systematic review and non-linear dose-response meta-analysis of 230 cohort studies with 3.74 million deaths among 30.3 million participants. *The BMJ*, *353*, i2156. https://doi.org/10.1136/bmj.i2156

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risk of body dysmorphia.[6] Socially, the rigidity required to sustain extreme leanness breeds isolation, making spontaneous meals with friends impossible and placing a strain on intimate relationships.

Therefore, if your 'why' is health, then you must know when to stop. Losing fat to correct metabolic dysfunction is medicine; losing fat to chase a paper-thin skinfold reading on a calliper test when you are already lean is a form of vanity that carries risks. Both are permissible, but you cannot confuse them.

Statistically, the most favourable body fat percentage ranges for health have been shown to be between 12% and 20% for men, and 20% and 30% for women.[7] To estimate your own body fat percentage, see §10.6.2.2.

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[6] Fagerberg, P. (2018). Negative consequences of low energy availability in natural male bodybuilding: A review. *International Journal of Sport Nutrition and Exercise Metabolism*, *28*(4), 385–402. https://doi.org/10.1123/ijsnem.2016-0332; Mountjoy, M., Sundgot-Borgen, J. K., Burke, L. M., Ackerman, K. E., Blauwet, C., Carmody, N., Ljungqvist, A., Maughan, R. J., Melin, A. K., Meyer, N. L., Sherman, R. T., Tenforde, A. S., Klungland Torstveit, M., & Budgett, R. (2018). IOC consensus statement on relative energy deficiency in sport (RED-S): 2018 update. *British Journal of Sports Medicine*, *52*(11), 687–697. https://doi.org/10.1136/bjsports-2018-099193

[7] Abernathy, R. P., & Black, D. R. (1996). Healthy body weights: An alternative perspective. *The American Journal of Clinical Nutrition*, *63*(3), 448S–451S. https://doi.org/10.1093/ajcn/63.3.448

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2.3. Performance

The third domain is performance. This is the realm of the athlete and the competitor. In sports that require the body to move through space, fat is non-functional mass. It is weight that does not contract, weight that must be accelerated and decelerated against gravity. For the endurance athlete, shedding excess body fat is akin to taking a weighted vest off before a race; the improvement in power-to-weight ratio is immediate and mathematical.

However, even in performance, the ‘why’ is complex. Mass moves mass. If you are a powerlifter or a strongman, then the leverage provided by a larger body, and the sheer mass that stabilizes a heavy load, can be advantageous. Losing fat might improve your Wilks score or your relative strength, but it might decrease your absolute strength.

The performance athlete should weigh the benefit of leanness against the cost of recovery. A deficit is a recovery debt. You cannot train at maximum capacity while restricting energy. The ‘why’ here must be calculated: is the performance gain from being lighter greater than the performance loss from being under-fuelled?

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2.4. Is fat loss the right goal for you?

Recognizing these three domains—aesthetics, health and performance—is the easy part. The hard part is determining if any of them apply to you right now. Fat loss is not the right goal for everyone. In fact, for many people, right now is the worst time to attempt a diet.

Dieting is stressful. It is a physiological stressor that elevates cortisol and signals to your brain that a famine is occurring. If your life is already characterized by high stress—if you are going through a divorce, studying for the bar exam, grieving a loss, fighting off a cold or suffering from severe sleep deprivation—then adding the stress of a calorie deficit is often a recipe for failure. You have a limited capacity for systemic stress. If you pour the stress of dieting into a cup that is already overflowing, then you have a spill on your hands: you will not necessarily succeed, because you might well burn out before you get visibly leaner. Worse, you may cycle between rigid adherence and binge eating, damaging your relationship with food in the process.

Further, we must address the psychological readiness for fat loss. If you cannot distinguish your self-worth from your scale weight, then you might want to reconsider dieting. The pursuit of fat loss requires a level of stoicism and detachment. It requires you to view data points—calories,

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macronutrients, scale weight, waist measurements—as neutral information rather than moral judgements. If a fluctuation in water weight ruins your day, then you are not ready for the rigours of the process.

This brings us to the necessity of a powerful 'why'. The 'why' is your anchor. When you are three weeks into a deficit, and the initial excitement of the 'new you' has faded, and you are staring at a plate of egg whites while your friends eat pizza, motivation will be challenged and may evaporate. Motivation involves feelings that are fleeting and fickle. The practice of discipline can theoretically iron them out, but discipline requires a reason. You need a conviction that the discomfort you are feeling is serving a higher purpose.

If your 'why' is weak—'I guess I should lose a few kilograms because fashion or influencers seem to say so'—then you will fold at the first sign of resistance. The hunger will be too annoying, the gym too inconvenient, the social pressure to eat too great. But if your 'why' is robust—'I am doing this to prove that I have mastery over my own biology', or 'I am doing this to ensure that I can run around with my grandchildren without getting winded'—then the suffering becomes worthwhile. Nietzsche wrote, 'he who has a why to

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live can bear almost any how'.[8] The same applies to dieting. Those who have a why to diet can bear almost any deficit.[9]

If you were joining me for a private consultation, then we would scrutinize your 'why' together. I would listen to your motivations and, if necessary, tell you that your reasons are fragile. However, because a book is a one-way medium, I cannot provide that level of personal intervention here. The reflection, therefore, has to be your own. You have to be your own practitioner and evaluate your own motives.

This chapter is a gatekeeper. If you were to read the rest of this book and think, 'I can do the maths', then that is not enough. You must now look inward. Do you have a reason that justifies the cost, and are you in a place in your life where you can afford the energetic tax of a deficit? Is your desire for fat loss an expression of autonomy and self-improvement, or is it a capitulation to external pressures that you resent?

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[8] Nietzsche, F. (1954). *The portable Nietzsche* (W. Kaufmann, Ed. & Trans.). Viking Press. (Original work published 1889).

[9] Interestingly, a 24-week prospective analysis of over 36,000 people in a behavioural weight loss program found that participants motivated by 'whys' such as health and fitness achieved significantly greater weight loss and were less likely to drop out compared to those motivated primarily by appearance. See Wren, G. M., Koutoukidis, D. A., Scragg, J., Whitman, M., & Jebb, S. (2023). The association between goal setting and weight loss: Prospective analysis of a community weight loss program. *Journal of Medical Internet Research*, *25*, e43869. https://doi.org/10.2196/43869

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If you cannot answer these questions with clarity and conviction, then do not proceed to the application phase. Do not lower your calories. Maintain your weight. Focus on performance. Build muscle and hold a steady course. The deficit will always be available when you are ready. But until you have your ‘why’, the ‘how’ is useless.

If, however, you have examined your motives and found them sound—understanding and accepting the costs while viewing this journey as a project of self-construction—then you are ready. You are prepared to engage with the rest of this book and endure the temporary discomfort for the sake of the desired gain. You are now equipped to enter the deliberate, rational, challenging and transformative process of fat loss.

2.5. Key takeaways

- A powerful, self-examined philosophical conviction (the ‘why’) is a prerequisite for a fat-loss diet; without it, the mechanical ‘how’ is useless.
- This ‘why’ must be grounded in the three valid domains—aesthetics, health and/or performance—and should only be pursued when the dieter is psychologically ready and not under high systemic stress.

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Chapter 3. What is fat loss?

At first glance, the title of this chapter may appear to border on the redundant. Asking ‘what is fat loss?’ in a book dedicated to the subject seems akin to opening a cookbook by asking what food is. It is a question that most people believe they answered long ago, likely the moment they first stepped onto a bathroom scale and decided that they wanted the number staring back at them to be smaller. However, we have to look deeper than the surface-level assumption that all weight loss is created equally. While often correlated, fat loss and weight loss are distinct processes, and treating them as identical can lead to suboptimal results.

3.1. The limits of the bathroom scale

The distinction between losing fat and losing weight is the difference between achieving a chiselled, athletic physique and simply becoming a smaller version of your current self. In the general population, the terms are used interchangeably. ‘I need to lose weight’ is the universal mantra of the dieter. The scale is a useful tool for tracking trends, but it is an instrument that lacks nuance. It cannot distinguish between the shedding of fat, the loss of muscle tissue, the fluctuation of total body water or the depletion of glycogen stores within the muscle bellies. When you stand on the scale, you are weighing everything: your bones, your

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organs, your blood, your muscle, your fat and even the contents of your digestive tract. To the scale, a kilogram of muscle lost registers the same as a kilogram of fat lost. To your aesthetics and your long-term health, however, the two outcomes are diametrically opposed.

Fat loss, specifically, refers to the oxidation of stored triglycerides within adipose tissue cells. It is commonly tracked as a reduction of body fat percentage, i.e., the ratio of fat mass to total body mass.[10] For the trainee who is prioritizing protein and resistance training, the scale moving down is usually a reliable indicator of this process. However, without those fundamentals, weight loss is no longer an accurate proxy for fat loss. It is entirely possible to lose weight while becoming relatively fatter, a scenario often seen in sedentary crash dieters who drastically restrict calories and neglect protein and resistance training. They become lighter, yes, but their body fat percentage may stay stagnant or even rise as they cannibalize muscle tissue, leading to the dreaded skinny-fat condition.

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[10] Note that lowering your body fat percentage is not strictly synonymous with absolute fat loss. Because body fat percentage is a relative ratio, it is mathematically possible to gain body fat while lowering your overall body fat percentage, provided that your lean mass increases at a disproportionate rate. For example, going from a total body weight of 80 kg with 20 kg of body fat (25% body fat) to 90 kg with 21 kg of body fat (23.3% body fat) means that you became leaner percentagewise, despite gaining 1 kg of fat mass.

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3.2. The phenomenon of body recomposition

To understand why we distinguish fat loss from weight loss, we have to acknowledge that there exists a physiological state where the two diverge. This is the phenomenon of body recomposition: losing fat and building muscle simultaneously. For specific groups of people, the scale may stay flat even as they make significant visual progress. Understanding these categories is essential because they demonstrate why the scale should not always be the sole arbiter of progress.

3.2.1. The beginner trainee

The first and most prominent category consists of the beginner trainee. If you have never touched a barbell or seriously engaged in resistance training, then your body is primed for adaptation. The stimulus of lifting weights is so novel and potent that the body will prioritize muscle growth even in a calorie deficit. The physiological signalling is unambiguous: survival requires an adaptation to this new stress. Consequently, a beginner can shed body fat while packing on considerable muscle mass. They might look in the mirror after three months of weight training and see a different person, yet step on the scale to find that they weigh the same as when they started. For this group, chasing weight

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loss can be a detriment, as it might lead them to undereat and sabotage this unique newbie-gains window.[11]

3.2.2. The ineffective trainee

The second category is similar to the first, though the people in it often do not realize it. This group comprises those who have been training for some time—perhaps even years—but have been doing so with insufficient intensity. These are the people who are effectively spinning their wheels in the gym. When these people finally switch to an optimized approach—training near or to failure and emphasizing progressive overload—their bodies respond with a surge of adaptation similar to that of a rank novice. Because they were never truly trained to their potential, they possess a reservoir of unrealized gains. For them, the introduction of a proper stimulus can spark a period of recomposition where fat melts off and muscle packs on, once again rendering the scale a simplistic metric.

3.2.3. The returning trainee

The third category consists of people returning to training after a substantial layoff. Perhaps due to injury, life

[11] This risk is significantly lower for an overweight beginner, who possesses ample stored body fat to fund the energy-intensive process of building new muscle tissue. A leaner beginner, however, lacks these endogenous fat reserves, meaning that calorie restriction will reduce their capacity to adapt and grow.

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circumstances or simple burnout, these people have lost muscle mass and likely gained body fat during their time away. However, they return with a physiological advantage commonly known as muscle memory.

This phenomenon is caused by lasting epigenetic changes that permanently bookmark the DNA instructions for muscle growth. Even after the muscle itself has shrunk from disuse, these genetic pathways remain accessible.[12]

Upon returning to the gym, the cellular machinery for protein synthesis is already on standby. Because the body does not have to learn how to build that tissue from scratch, the returning lifter can regain lost muscle at a rate that far exceeds the slow, arduous process of initial growth, often while simultaneously shedding the fat accumulated during their break. For this group, chasing scale weight can be a poor metric for progress; their overall body weight will often stall or even increase as their muscle rapidly reinflates to its former glory.

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[12] Snijders, T., Aussieker, T., Holwerda, A., Parise, G., van Loon, L. J. C., & Verdijk, L. B. (2020). The concept of skeletal muscle memory: Evidence from animal and human studies. *Acta Physiologica*, *229*(3), e13465. https://doi.org/10.1111/apha.13465

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3.2.4. The enhanced trainee

The fourth category includes people using exogenous hormonal assistance, specifically anabolic-androgenic steroids and other performance-enhancing drugs. These compounds radically alter the body's nutrient partitioning. By supraphysiologically elevating protein synthesis and nitrogen retention, these agents allow for muscle accretion and fat oxidation to occur simultaneously in a manner that is largely unachievable for the natural trainee, particularly the advanced one. While this book does not advocate for or guide the use of these substances, omitting this category would leave this section incomplete.

3.3. The limits of body recomposition

Why, then, if fat loss is distinct from weight loss, will much of this book focus on tracking weight loss? The answer is to do with the physiological mismatch between how quickly we can lose fat and how slowly we can build muscle.

Fat loss is a relatively rapid process; muscle growth is a slow one. Even for the genetic outlier or the beginner enjoying the newbie gains mentioned above, it is physiologically impossible to build muscle at the same speed by which you can burn fat.

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For the majority of readers, the most efficient path to a leaner, more aesthetic physique necessitates a reduction in total body weight. You simply cannot build muscle quickly enough to offset the fat that you need to lose if you are looking for a noticeable visual transformation. If you need to lose five kilograms of fat to reveal your abdominals, then it is highly unlikely that you will build five kilograms of muscle in the same eight-week period to keep your weight stable. Therefore, scale weight will indeed go down, and it should. However—and this is the crux of the entire philosophy—the weight loss is a proxy for fat loss, not the sole objective.

3.4. On the importance of holding onto muscle

The nuance matters because it determines your methods. If your goal were simply weight loss at any cost, then besides chopping off limbs, the most efficient method would be to stop lifting weights, do hours of cardio and eat next to nothing at all. You would lose weight rapidly, but an unacceptably high proportion of that loss would come from your lean tissue. You would likely end up looking worse. Because our goal is fat loss, we should fight tooth and nail to prevent that weight loss from coming from lean tissue. This changes a few things, particularly the amount of protein required and the nature of training.

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Muscle preservation should be a central goal of any diet. Every gram of muscle that you keep is a victory. Muscle contributes to the aesthetics of the physique. Fat loss is a subtractive process; it reveals what is underneath. If you subtract the fat only to reveal a lack of muscle, then the result is a smaller, but not necessarily better, shape.

3.5. Key takeaways

- Weight loss and fat loss generally go together but are distinct.
- The bathroom scale is an excellent proxy for progress but cannot distinguish between changes in fat, muscle, water or glycogen.
- Body recomposition (building muscle while losing fat) is possible for those with unrealized muscular potential, those returning from a layoff or those on supraphysiological doses of anabolic steroids, making scale weight an incomplete metric for these groups.
- Muscle preservation should be a central goal of a diet; any reduction in total body weight should be strategically engineered to come mainly from fat stores.

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Chapter 4. The energy balance equation

The human body, for all its biological complexity and hormonal nuance, is bound by the physics of the universe. To understand fat loss, we need to understand the energy balance equation, i.e., the mechanism that governs whether you gain, lose or maintain weight over time.

4.1. The first law of thermodynamics

At the heart of fat loss is the first law of thermodynamics, a principle of physics stating that energy cannot be created or destroyed; it can only be transferred or transformed from one form to another. In the context of the universe, this means that the total amount of energy is constant. In the context of the human body, it means that the energy we consume has to go somewhere. Calories do not vanish into a void, nor do we manifest body fat out of thin air.

When you eat an apple, a curry, a slice of cake or drink a protein shake, you are consuming potential chemical energy. Your body has a choice in how to handle this influx. It can convert that energy into immediate kinetic energy to fuel your movement or use it as internal fuel to maintain your body temperature and power your nervous system. If the energy coming in matches the energy required for these

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tasks, then the system is in balance. However, if there is a surplus of incoming energy that cannot be immediately used, then the body—having evolved to survive periods of caloric scarcity—stores that chemical energy for later use, primarily in body fat.[13] It is a kind of battery, if you will.

Conversely, when you require more energy than you have provided through food, the body cannot create fuel from nothing. It must turn to its reserves, transforming the stored chemical energy in your fat cells back into usable fuel. This is the only way that fat loss occurs. There is no pill or powder that bypasses this law. To lose fat is to force the body to cannibalize its own energy stores to make up for a deficit.[14]

4.2. Demystifying calories in, calories out

This brings us to a controversial acronym in the fitness world: CICO, or Calories In, Calories Out. At its core, CICO

[13] To be highly technical, this is a slight oversimplification. Carbohydrates rarely convert directly into body fat via a process called *de novo* lipogenesis, which is microscopic in humans under normal conditions. Instead, surplus carbohydrates fill the liver and muscle glycogen stores and shut down fat oxidation. This effectively forces the dietary fat that you consume to be shuttled into your long-term fat stores (unless it is first needed to replenish depleted intramuscular triglycerides, or local muscle fat).

[14] Even if your scale weight stays stable while building muscle and losing fat simultaneously, an energy deficit still exists. Building new muscle requires calories. If you are only eating enough to maintain your body weight, then your body must fund this new tissue construction by cannibalizing your stored fat.

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is just a description of objective reality, representing the net energy balance of the organism.

The Calories In side of the equation seems straightforward—it is the food and drink that you consume. However, your appetite—the main driver of Calories In—is influenced by hormones such as ghrelin and leptin, your sleep quality, social pressure, your stress levels and the hyper-palatable nature of modern processed foods. While you ultimately control what you put in your mouth, many biological and environmental factors influence that decision.

The Calories Out side is more complex. It is a dynamic, adaptive system. If you cut calories, then your body may downregulate its energy expenditure to ensure survival, making the Out portion smaller. If you eat different macronutrients, then the energy required to digest them changes. Therefore, while CICO is always the mechanism of weight loss, it is a complex interaction where the quality of your food, your hormonal health, your lifestyle choices and your environmental cues determine how easy or hard it is to balance the equation.

4.3. The components of TDEE

To understand the energy balance equation, we have to break down the Calories Out side. We often refer to this as

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Total Daily Energy Expenditure, or TDEE. This is the total number of calories that your body burns in a twenty-four-hour period. Many people make the mistake of equating TDEE solely with exercise, assuming that the hour that they spend in the gym constitutes the majority of their calorie burn. In reality, TDEE is composed of four components, and formal exercise is often the smallest among them.

4.3.1. Basal Metabolic Rate (BMR)

The first and largest component is the Basal Metabolic Rate, or BMR. This is the energy that your body requires to maintain essential physiological functions at rest. If you were to lie in a comatose state in a dark room for twenty-four hours, moving nothing, thinking little and digesting nothing, then you would still burn a substantial number of calories. Your heart pumping blood, your lungs inflating, your brain firing neurons and your cells dividing all require much fuel. For the average person, Resting Energy Expenditure (REE, which includes your BMR plus the energy needs of wakefulness) accounts for roughly sixty to seventy percent of total daily energy expenditure.[15] BMR is influenced by factors such as age, sex, genetics and muscle mass.

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[15] National Academies of Sciences, Engineering, and Medicine. (2023). *Dietary reference intakes for energy*. The National Academies Press. https://doi.org/10.17226/26818

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4.3.2. Non-Exercise Activity Thermogenesis (NEAT)

The second component is Non-Exercise Activity Thermogenesis, or NEAT. This term encompasses all of the calories that you burn through movement that is neither basic biological maintenance—like sleeping and eating—nor intentional, sports-like exercise. It is the energy used for walking to the car, typing on a keyboard, fidgeting at your desk, cooking dinner, standing while waiting for the bus and maintaining your posture. While these movements may seem trivial in isolation, they accumulate to a large portion of your daily calorie burn. NEAT can vary wildly between people—by up to two thousand calories a day—depending on occupation and lifestyle.[16] A construction worker has a naturally high NEAT, while an office worker has a low one. When people wonder why they cannot lose weight despite going to the gym for an hour a day, the answer is sometimes partly here. They train hard for one hour (EAT) but are sedentary for the other fifteen waking hours, resulting in a low overall NEAT.

4.3.3. The Thermic Effect of Food (TEF)

The third component is the Thermic Effect of Food, or TEF. Digestion requires energy. The body must break down food,

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[16] Levine, J. A. (2002). Non-exercise activity thermogenesis (NEAT). *Best Practice & Research Clinical Endocrinology & Metabolism*, *16*(4), 679–702. https://doi.org/10.1053/beem.2002.0227

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extract nutrients and store them, and this mechanical and chemical labour costs calories. Roughly ten percent of your daily energy intake is lost to the process of digestion, though this varies by macronutrient. Fats are very easy to digest and have a low thermic effect, roughly zero to three percent. Carbohydrates are moderate, sitting around five to ten percent. Protein, however, induces the greatest thermic response. It is complex and difficult for the body to break down, with a thermic effect of twenty to thirty percent.[17] This means that for every hundred calories of protein you eat, your body effectively only nets seventy to eighty, having burned the rest just to process the meal. While this is a metabolic advantage of a high-protein diet, the impact on your daily Calories Out is relatively small unless you make drastic, unrealistic changes to your macronutrient intake.

4.3.4. Exercise Activity Thermogenesis (EAT)

The fourth and final component is Exercise Activity Thermogenesis, or EAT. This constitutes the calories burned during intentional physical activity, e.g., lifting weights, running, cycling or taking a yoga class. Surprisingly, for most people, this accounts for only five to ten percent of their

[17] Ravn, A.-M., Gregersen, N. T., Christensen, R., Rasmussen, L. G., Hels, O., Belza, A., Raben, A., Larsen, T. M., Toubro, S., & Astrup, A. (2013). Thermic effect of a meal and appetite in adults: An individual participant data meta-analysis of meal-test trials. *Food & Nutrition Research*, *57*(1), 19676. https://doi.org/10.3402/fnr.v57i0.19676

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TDEE.[18] While exercise is indispensable for heart health, muscle building and mental well-being, it is often far less effective for pure calorie burning than we are led to believe. A rigorous thirty-minute jog might burn three hundred calories,[19] an amount easily erased by a single large bagel. This is why the adage 'you cannot out-train a bad diet' holds true. Although a highly trained cyclist might burn 2,000 to 3,000 calories in a four-hour ride, allowing EAT to make up a much larger percentage of their TDEE, only the most highly trained athletes have the work capacity to burn enough calories to impact energy balance so meaningfully. And by the time they reach that level, they generally do not need to lose fat.

4.4. The energy balance continuum

When we view these components together—BMR, NEAT, TEF and EAT—we get the full picture of the body's energy demands. When we compare this Total Daily Energy Expenditure (calories out) against our energy intake (calories in), we can place ourselves on the energy balance continuum. This continuum has three distinct states: surplus,

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[18] Kenney, W. L., Wilmore, J. H., & Costill, D. L. (2021). *Physiology of sport and exercise* (8th ed.). Human Kinetics.

[19] Ainsworth, B. E., Haskell, W. L., Herrmann, S. D., Meckes, N., Bassett, D. R., Jr., Tudor-Locke, C., Greer, J. L., Vezina, J., Whitt-Glover, M. C., & Leon, A. S. (2011). 2011 Compendium of Physical Activities: A second update of codes and MET values. *Medicine & Science in Sports & Exercise*, *43*(8), 1575–1581. https://doi.org/10.1249/mss.0b013e31821ece12

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maintenance and deficit. Understanding which state you are in, and how to navigate between them, is central to keeping body fat off long-term.

The centre of the continuum is maintenance. This is the state of equilibrium where energy intake equals energy output. In this state, your weight is stable. Maintenance is best understood as a dynamic range. You might eat slightly more on Tuesday and slightly less on Wednesday, or move a bit more on Saturday than Sunday, but over the course of the week, these daily fluctuations often average out to a relatively constant weight.

To the right of maintenance is the surplus. This is the anabolic state where energy intake exceeds expenditure. In a surplus, the body has extra energy and has to decide what to do with it. If you are providing a stimulus to your muscles through resistance training, then the body can use this surplus energy to build new muscle tissue. This is why bodybuilders and athletes often intentionally enter a bulking phase. However, without that stimulus, or if the surplus is too large, the body defaults to its primary storage mechanism: fat accumulation. A calorie surplus may be necessary for optimal muscle gain,[20] but it is also the main enemy of fat loss.

[20] A calorie surplus is conditionally necessary for optimal muscle growth. Consider my stats when I started lifting in September 2015 at age 16: 178 cm, 57 kg and 10% body fat. If I wished to gain the 16.2 kg of lean mass

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To the left of maintenance is the deficit. When you consume fewer calories than your TDEE, you create an energy gap and lose weight.

4.5. Key takeaways

- Weight loss is strictly governed by the first law of thermodynamics: energy intake must be less than energy expenditure for the body to lose weight.
- While Calories In, Calories Out (CICO) is the mechanism of weight loss, the Calories In side is influenced by factors such as hormones, sleep, stress and food quality.
- Total Daily Energy Expenditure (TDEE) is primarily determined by your Basal Metabolic Rate (BMR), which accounts for 60–70% of your total burn; formal exercise (EAT) is often the smallest component, confirming that you 'cannot out-train a bad diet'.

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required to reach 75 kg at that same 10% body fat, then mathematically, there was no way that I could do it without bulking because consuming maintenance calories would guarantee that my total body mass stayed at 57 kg. At 10% body fat, I only carried 5.7 kg of total fat mass. Therefore, gaining 16.2 kg of lean mass while remaining at 57 kg would have required me to lose 16.2 kg of fat, which would have left me with an impossible negative fat mass (-10.5 kg). To construct that new tissue, a sustained calorie surplus was required to drive my total body weight upward.

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- Maintenance calories keep your weight stable, a calorie surplus makes you gain weight, and a calorie deficit makes you lose weight.

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Chapter 5. Metabolism myth-busting

It is difficult to commit to a fat-loss phase when you believe that the game is rigged against you from the start. This chapter dismantles the three most pervasive myths that paralyse dieters. First, we will explain the difference between the pseudoscience of starvation mode and the real reasons your metabolism slows down. Second, we will look at the battle between your genetics and your environment to see which one is really to blame for weight gain. Last, we will put hormones in their place, showing that they do not necessarily decide your fate.

5.1. Starvation mode vs adaptation

There is a pervasive fear among dieters that if they eat too little, then their metabolism will crash, effectively halting fat loss or, paradoxically, causing weight gain. This is the myth of starvation mode. The idea suggests that the body, sensing a famine, will zealously hoard body fat and shut down energy expenditure entirely to survive. While the survival instinct is real, the physiological manifestation is far less dramatic than the myth implies.

When you restrict calories and lose body mass, your Total Daily Energy Expenditure (TDEE) drops. This occurs for several reasons, none of which signifies a broken

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metabolism. First, a smaller body simply requires less energy to move and exist. There is less tissue to support and less mass to propel through space. Second, the Thermic Effect of Food (TEF)—the energy required to digest and process what you eat—decreases because you are eating less. These are mechanical reductions. However, there is a third component known as adaptive thermogenesis, or metabolic adaptation, which is the true source of the starvation mode myth.

Adaptive thermogenesis is the body's attempt to close the energy gap. When energy availability is low, the body downregulates nonessential functions to conserve fuel. You might find yourself feeling more lethargic while unconsciously reducing your fidgeting and spontaneous movement. This is a reduction in Non-Exercise Activity Thermogenesis (NEAT). Simultaneously, the efficiency of your mitochondria may improve, meaning that your body extracts more energy from every calorie and wastes less as heat.[21] Your resting metabolic rate may dip slightly below what would be predicted for your new weight. But—and this is the critical distinction—it does not stop. The metabolism does not shut down. It merely slows to preserve the remaining energy stores.

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[21] Trexler, E. T., Smith-Ryan, A. E., & Norton, L. E. (2014). Metabolic adaptation to weight loss: Implications for the athlete. *Journal of the International Society of Sports Nutrition*, *11*(1), Article 7. https://doi.org/10.1186/1550-2783-11-7

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The Minnesota Starvation Experiment, a landmark study from the 1940s, is the ultimate refutation of the starvation mode myth. Participants were subjected to semi-starvation diets for months, losing substantial amounts of body weight. Their metabolic rates did drop markedly, sometimes by up to 40%, but they never stopped losing weight until they reached dangerously low levels of body fat (around 5%). At no point did they spontaneously gain fat in a calorie deficit. The 'damage' was temporary; once they were refed, their metabolic rates recovered.[22] The lesson is that metabolic adaptation is a hurdle, not a wall. It requires us to adjust our intake or activity levels as we get leaner, but it does not render fat loss impossible.

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[22] Keys, A., Brožek, J., Henschel, A., Mickelsen, O., & Taylor, H. L. (1950). *The biology of human starvation* (Vols. 1–2). University of Minnesota Press. It is worth noting that during the refeeding phase of this experiment, the participants' hunger remained elevated, driving them to keep gaining weight until their original muscle mass was fully restored. Because they had lost substantial muscle mass and were not doing anything to rebuild it actively—such as resistance training—during the refeeding phase, they experienced a fat overshoot, ending up with significantly more body fat than they carried prior to the experiment. This phenomenon further bolsters the argument for prioritizing muscle preservation during weight loss. If you lose muscle, then the biological drive to get that muscle back may lead to excessive fat gain.

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5.2. Genetics vs environment

It is common to hear people lament that they are simply built to be heavy, or conversely, that others are blessed with a fast metabolism that allows them to eat with impunity.

Genetics do play a substantial role in body composition and appetite regulation. However, the human gene pool has stayed largely constant over the last fifty years, yet obesity rates have skyrocketed. If genetics were the sole cause, then we would not see such rapid surges in population obesity. This development can only be ascribed to the modern obesogenic environment. We live in a world designed to maximize calorie intake and minimize physical exertion. Hyper-palatable, calorie-dense foods are available cheaply and instantly, while our daily lives require less movement than ever before.

In this context, genetics can be viewed as the loaded gun, while the environment pulls the trigger. Some people may possess a genetic makeup that makes them more responsive to food cues while being less sensitive to satiety signals.[23] In a food-scarce environment, these genes would be a survival advantage. In the modern food environment, they are a

[23] Llewellyn, C. H., & Fildes, A. (2017). Behavioural Susceptibility Theory: Professor Jane Wardle and the role of appetite in genetic risk of obesity. *Current Obesity Reports*, *6*, 38–45. https://doi.org/10.1007/s13679-017-0247-x

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liability. Conversely, those with a genetic predisposition toward leanness would also have lower appetites or higher levels of NEAT. These are the people who might pace around the room while talking on the phone or simply forget to eat when they are busy.

Genetics influence our behaviours and our drives more than they influence the physics of fat loss. A person with a genetic predisposition to obesity does not violate the laws of thermodynamics; they simply have to fight harder against their internal drive to eat. They may feel hungrier than a naturally lean person at the same level of calorie restriction. This is a greater challenge, but it is not insurmountable. It means that for some, the path to leanness requires more strategy, conscious effort and psychological resilience. The playing field may not be level, but the game can still be won. Controlling our environment and our habits—removing trigger foods, prioritizing protein and whole foods, employing volume eating and maintaining a resistance training regimen—allows us to override genetic propensities.

5.3. On hormones

After considering genetic predispositions, it is necessary to examine the endocrine system's role in managing metabolic processes. In the carb-insulin model and other reductionist theories, insulin is identified as the primary cause of fat

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retention. Specifically, it is claimed that insulin promotes fat storage and inhibits fat loss regardless of calorie intake. This perspective suggests that hormonal activity can supersede the laws of energy balance.

In reality, hormones are physiological signalling molecules. They communicate the state of the body's energy availability and direct resources accordingly, but they still operate within the constraints of energy balance.

Insulin is indeed an anabolic hormone that facilitates the storage of nutrients, including fat. When you eat a meal, insulin levels rise to shuttle glucose and fatty acids into cells. However, this storage phase is only half of the cycle. In the hours between meals and during sleep, insulin levels fall, allowing the body to mobilize stored energy. Fat balance is the net result of these periods of storage and mobilization over days and weeks.[24] If you are in a calorie deficit, then the periods of mobilization will exceed the periods of storage, and you will lose fat, regardless of transient spikes in insulin. Studies controlling for calories and protein have repeatedly shown that high-carbohydrate diets (which stimulate more insulin) result in the same fat loss as low-carbohydrate diets (which keep insulin low), provided that energy intake is

[24] Gropper, S. S., Smith, J. L., & Carr, T. P. (2021). *Advanced nutrition and human metabolism* (8th ed.). Cengage Learning.

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equal.[25] Insulin partitions energy, but it cannot create energy out of thin air.

Another frequently cited hormonal hurdle is the thyroid, particularly concerning hypothyroidism (an underactive thyroid). Thyroid hormones regulate your Basal Metabolic Rate (BMR). When thyroid function is impaired, BMR decreases, meaning that the body burns fewer calories at rest. This drop in daily energy expenditure makes it easier inadvertently to eat in a calorie surplus, which is why weight gain is a common symptom. However, an underactive thyroid does not defy thermodynamics. Theoretically, you could still lose weight with unmedicated hypothyroidism by sufficiently reducing your calorie intake to account for the lowered metabolic rate. Of course, the correct approach is to consult a physician and medicate the condition. Once properly treated with synthetic thyroid hormone, your BMR is restored to a normal, healthy range. If you are medicated and your hormone levels are normalized, then your thyroid presents no physiological barrier to weight loss whatsoever.

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[25] Hall, K. D. (2017). A review of the carbohydrate–insulin model of obesity. *European Journal of Clinical Nutrition*, *71*(3), 323–326. https://doi.org/10.1038/ejcn.2016.260; Naude, C. E., Schoonees, A., Senekal, M., Young, T., Garner, P., & Volmink, J. (2014). Low carbohydrate versus isoenergetic balanced diets for reducing weight and cardiovascular risk: A systematic review and meta-analysis. *PLoS ONE*, *9*(7), e100652. https://doi.org/10.1371/journal.pone.0100652

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Similarly, the hormones leptin and ghrelin are sometimes misunderstood as unstoppable forces. Leptin is produced by fat cells and signals satiety and energy sufficiency to the brain. When body fat levels are high, leptin levels are high, theoretically reducing hunger and increasing energy expenditure. However, in obesity, a state of leptin resistance can occur, where the brain no longer hears the signal, leading to continued hunger despite ample energy stores.[26] Conversely, as you diet and lose body fat, leptin levels drop.[27] This drop triggers increased hunger and the metabolic downregulation discussed earlier.

Ghrelin, often called the hunger hormone, acts in opposition to leptin. Produced in the stomach, it signals the brain to seek food. Ghrelin levels typically rise before meals and fall after eating.[28] During a prolonged diet, ghrelin levels tend to increase, making the dieter feel consistently hungrier.

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[26] Considine, R. V., Sinha, M. K., Heiman, M. L., Kriauciunas, A., Stephens, T. W., Nyce, M. R., ... & Caro, J. F. (1996). Serum immunoreactive-leptin concentrations in normal-weight and obese humans. *New England Journal of Medicine*, *334*(5), 292–295. https://doi.org/10.1056/NEJM199602013340503

[27] MacLean, P. S., Bergouignan, A., Cornier, M. A., & Jackman, M. R. (2011). Biology's response to dieting: The impetus for weight regain. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, *301*(3), R581–R600. https://doi.org/10.1152/ajpregu.00755.2010

[28] Cummings, D. E., Purnell, J. Q., Frayo, R. S., Schmidova, K., Wisse, B. E., & Weigle, D. S. (2001). A preprandial rise in plasma ghrelin levels suggests a role in meal initiation in humans. *Diabetes*, *50*(8), 1714–1719. https://doi.org/10.2337/diabetes.50.8.1714

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Unfortunately, we cannot simply turn off ghrelin or boost leptin with a magic pill, but we can modulate their effects through lifestyle choices. Sleep deprivation, for example, has been shown to lower leptin and raise ghrelin, increasing hunger and cravings.[29] Chronic stress elevates cortisol, which can dysregulate appetite and is associated with visceral fat storage.[30] Highly processed foods can bypass natural satiety signals, leading to overconsumption before the hormonal messengers can say 'stop'.[31]

Therefore, managing hormones is about creating an internal environment that makes adhering to a deficit tolerable. As the later chapters will detail, a high-protein diet, regular

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[29] Spiegel, K., Tasali, E., Penev, P., & Van Cauter, E. (2004). Brief communication: Sleep curtailment in healthy young men is associated with decreased leptin levels, elevated ghrelin levels, and increased hunger and appetite. *Annals of Internal Medicine*, *141*(11), 846–850. https://doi.org/10.7326/0003-4819-141-11-200412070-00008

[30] Tomiyama, A. J. (2019). Stress and obesity. *Annual Review of Psychology*, *70*(1), 703–718. https://doi.org/10.1146/annurev-psych-010418-102936

[31] Dicken, S. J., Jassil, F. C., Brown, A., Kalis, M., Stanley, C., Ranson, C., Ruwona, T., Qamar, S., Buck, C., Mallik, R., Hamid, N., Bird, J. M., Brown, A., Norton, B., Gandini Wheeler-Kingshott, C. A. M., Hamer, M., van Tulleken, C., Hall, K. D., Fisher, A., ... Batterham, R. L. (2025). Ultraprocessed or minimally processed diets following healthy dietary guidelines on weight and cardiometabolic health: A randomized, crossover trial. *Nature Medicine*, *31*(10), 3297–3308. https://doi.org/10.1038/s41591-025-03842-0

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resistance training, volume eating and adequate sleep all help to align these hormonal signals with our goals.

5.4. Key takeaways

- Starvation mode is a myth; while metabolic adaptation causes energy expenditure to drop as you lose weight, this does not halt fat loss in a calorie deficit.
- Your genetics do set your susceptibility to the modern obesogenic environment (hyper-palatable food, low activity), but conscious, strategic effort can override genetic predispositions to eat.
- Hormones (such as insulin, thyroid, leptin and ghrelin) influence metabolism and appetite, but they operate within the confines of the energy balance equation; they can be managed through medical treatment when impaired, alongside lifestyle factors such as a high protein intake, resistance training, volume eating and adequate sleep.

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Chapter 6. The three pillars of effective dieting

To transform your body—to shed body fat while revealing the shape and muscle underneath—you simply need to respect and adhere to the three pillars of effective dieting.

These three pillars are (1) a calorie deficit; (2) sufficient protein intake; and (3) resistance training. These are the foundation upon which almost every successful transformation is built. If you have these three elements in place, then you will lose fat and improve your body composition, regardless of whether you eat six meals a day or one, regardless of whether you avoid gluten or embrace it and regardless of whether you track your macronutrients in an app or use your hand to portion your food. If you remove any one of these pillars, however, then the structure collapses. Even if you lose weight, you will likely not look the way you want to look.

The rest of this book is dedicated to the specifics: the techniques of calculating your deficit, the precise grams of protein you require, the programming of your workouts and other behavioural strategies. But before we get to the 'how', we must establish the 'why'. We must understand why these

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three variables are the primary drivers of fat loss, and why all other factors are secondary.

6.1. Pillar one: the calorie deficit

The first and preeminent pillar has already been adumbrated: the calorie deficit. As we saw in chapter 4, if you consume less energy than your body requires to maintain its current state, then it must tap into its internal reserves. There is no way around this home truth. There is no diet in history that has produced weight loss without creating a calorie deficit, whether by design or by accident.

When a proponent of the ketogenic diet tells you that they lost weight despite eating copious amounts of fat, they did not cheat physics. They simply felt more satiated by the high fat and protein intake, which led them spontaneously to eat fewer total calories. When a low-fat vegan loses weight, it is not because plants have magical fat-melting properties; it is because the high fibre and water content of their food created fullness on fewer calories.

This has been demonstrated in rigorously controlled metabolic ward studies. When participants are monitored in a lab and every calorie consumed and burned is strictly counted, researchers find that equating calories across different diets results in virtually identical amounts of body

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fat lost, regardless of whether those calories come from carbohydrates or fats.[32] The mechanism of action is always, without exception, the energy deficit.

Recognizing this will liberate you from food fear. There are no inherently fattening foods, only foods that are easier to overconsume. A single biscuit cannot make you gain fat unless it pushes your total energy intake for the day (and week) into a surplus. Conversely, 'clean' foods like avocados, olive oil and almonds can absolutely cause fat gain if eaten in quantities that exceed your energy needs.

This pillar is purely about mass. It determines the number on the scale. If you are in a deficit, then you will become smaller. If you are not in a deficit, then you will stay the same or grow larger. It is binary. However, as we established in chapter 3, becoming smaller is not necessarily the same as looking better, which brings us to the nuance that so many miss. A calorie deficit does not discriminate between burning fat and burning muscle. When the body needs energy, it will break down whatever is available, adipose tissue or muscle mass. If you only provide the first pillar, then you will

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[32] Hall, K. D., Chen, K. Y., Guo, J., Lam, Y. Y., Leibel, R. L., Mayer, L. E., Reitman, M. L., Rosenbaum, M., Smith, S. R., Walsh, B. T., & Ravussin, E. (2016). Energy expenditure and body composition changes after an isocaloric ketogenic diet in overweight and obese men. *The American Journal of Clinical Nutrition*, *104*, 324–333. https://doi.org/10.3945/ajcn.116.133561

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become a smaller, softer version of your current self. To ensure that the weight lost is primarily fat, we must introduce the second and third pillars.

6.2. Pillar two: sufficient protein intake

If the calorie deficit determines how much weight you lose, then protein largely determines what kind of weight you lose. As discussed in chapter 3, this is the distinction between weight loss and fat loss. Weight loss is simply a reduction in your total mass: water, glycogen, fat and muscle. Our goal is therefore not weight loss per se, but rather to lose fat while preserving—or even building—muscle mass. Preserving muscle while losing fat is what leads to the toned physique that most people desire.

Protein is the primary structural building block of the human body. It is used for internal maintenance like repairing tissues and building enzymes, but most importantly for our purposes, it is used to maintain muscle mass. When you place your body in a calorie deficit (pillar one), you are essentially creating a catabolic environment; an environment of breakdown. Your body is scavenging for energy. Without a sufficient signal to the contrary, your body views muscle tissue as an expensive luxury. Muscle requires calories to maintain, so if energy is scarce, then the body is

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evolutionarily inclined to shed that muscle to lower its overheads.

Consuming sufficient protein provides the amino acids necessary to repair and maintain muscle tissue even when energy is limited. When you keep protein intake high, you signal to the body that it has the raw materials needed to keep its lean mass, forcing it to burn body fat for fuel instead. This, along with resistance training, is why two people can lose the same amount of weight but look drastically different. The person who prioritized protein and resistance training will look lean and defined; the person who ignored protein and remained sedentary will look skinny-fat, with a lower body weight but a high body fat percentage.

Data from short-term interventions (approximately one month) suggest that when athletes maintain a 40% calorie reduction, the amount of protein consumed determines the quality of weight lost. Specifically, people consuming 2.4 g/kg of body weight daily preserved more lean body mass and lost more fat mass compared to those at 1.2 g/kg.[33]

[33] Longland, T. M., Oikawa, S. Y., Mitchell, C. J., Devries, M. C., & Phillips, S. M. (2016). Higher compared with lower dietary protein during an energy deficit combined with intense exercise promotes greater lean mass gain and fat mass loss: A randomized trial. *The American Journal of Clinical Nutrition*, *103*(3), 738–746. https://doi.org/10.3945/ajcn.115.119339

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Beyond muscle preservation, protein is the most satiating of all macronutrients.[34] One of the greatest enemies of a successful diet is hunger. If you are constantly ravenous, then willpower often fails. Protein suppresses the hunger hormone ghrelin and stimulates satiety hormones like peptide YY.[35] When you centre your meals around protein, you naturally feel fuller for longer, which makes adhering to the calorie deficit easier.

Data indicate that athletes consuming roughly 2.9 g protein/kg of body weight daily experience fewer food cravings than those at more moderate levels, such as 1.8 g/kg.[36] This satiating effect is backed by broader

[34] Lejeune, M. P. G. M., Westerterp, K. R., Adam, T. C. M., Luscombe-Marsh, N. D., & Westerterp-Plantenga, M. S. (2006). Ghrelin and glucagon-like peptide 1 concentrations, 24-h satiety, and energy and substrate metabolism during a high-protein diet and measured in a respiration chamber. *The American Journal of Clinical Nutrition*, *83*(1), 89–94. https://doi.org/10.1093/ajcn/83.1.89

[35] Batterham, R. L., Heffron, H., Kapoor, S., Chivers, J. E., Chandarana, K., Herzog, H., Le Roux, C. W., Thomas, E. L., Bell, J. D., & Withers, D. J. (2006). Critical role for peptide YY in protein-mediated satiation and body-weight regulation. *Cell Metabolism*, *4*(3), 223–233. https://doi.org/10.1016/j.cmet.2006.08.001; Leidy, H. J., Clifton, P. M., Astrup, A., Wycherley, T. P., Westerterp-Plantenga, M. S., Luscombe-Marsh, N. D., Woods, S. C., & Mattes, R. D. (2015). The role of protein in weight loss and maintenance. The American Journal of Clinical Nutrition, 101(6), 1320S–1329S. https://doi.org/10.3945/ajcn.114.084038

[36] Roberts, J., Zinchenko, A., Mahbubani, K. T., Johnstone, J., Smith, L., Merzbach, V., Blacutt, M., Banderas, O., Villasenor, L., Vårvik, F. T., & Henselmans, M. (2018). Satiating effect of high protein diets on resistance-trained individuals in energy deficit. *Nutrients*, *11*(1), Article 56. https://doi.org/10.3390/nu11010056

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meta-analytical evidence suggesting that elevated protein intake triggers feelings of fullness following a meal.[37]

Beyond mere hunger suppression, protein appears to play a protective role in an athlete's mental state during rigorous training cycles. When comparing intake levels, resistance-trained people reported lower levels of irritability, better overall moods and a reduction in the specific stress associated with strict dieting when their protein was maintained at approximately 2.8 g/kg. In contrast, those consuming closer to 1.6 g/kg reported higher levels of distress.[38]

Finally, as we established in chapter 4, protein possesses the highest Thermic Effect of Food (TEF) of all macronutrients. By centring your diet on protein, you are subtly boosting

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[37] Dhillon, J., Craig, B. A., Leidy, H. J., Amankwaah, A. F., Anguah, K. O.-B., Jacobs, A., Jones, B. L., Jones, J. B., Keeler, C. L., Keller, C. E. M., McCrory, M. A., Rivera, R. L., Slebodnik, M., Mattes, R. D., & Tucker, R. M. (2016). The effects of increased protein intake on fullness: A meta-analysis and its limitations. *Journal of the Academy of Nutrition and Dietetics*, *116*(6), 968–983. https://doi.org/10.1016/j.jand.2016.01.003

[38] Helms, E. R., Zinn, C., Rowlands, D. S., Naidoo, R., & Cronin, J. (2015). High-protein, low-fat, short-term diet results in less stress and fatigue than moderate-protein moderate-fat diet during weight loss in male weightlifters: A pilot study. *International Journal of Sport Nutrition and Exercise Metabolism*, *25*(2), 163–170. https://doi.org/10.1123/ijsnem.2014-0056

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your daily energy expenditure simply by forcing your body to work harder to digest your meals.[39]

Therefore, protein is highly beneficial for fat loss. You can debate whether you prefer your energy to come from carbohydrates or fats, but you cannot debate the primacy of protein. It manages hunger signals and protects lean mass, which allows the calorie deficit to achieve a superior reduction in body fat.

6.3. Pillar three: resistance training

The third and final pillar is resistance training, which is any exercise that causes your muscles to contract against an external force to stimulate growth and strength gain. While the first two pillars are nutritional, this one is behavioural, yet it is arguably just as determinative of the physiological outcome. We must stop viewing exercise solely as a way to burn calories. If your primary goal with exercise is to burn off the pizza that you ate last night, then you are fighting a losing battle. The calorie burn is beneficial, but the primary value of training is the anabolic signal that it sends to your body.

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[39] Halton, T. L., & Hu, F. B. (2004). The effects of high protein diets on thermogenesis, satiety and weight loss: a critical review. *Journal of the American College of Nutrition*, *23*(5), 373–385. https://doi.org/10.1080/07315724.2004.10719381; Westerterp, K. R. (2004). Diet induced thermogenesis. Nutrition & Metabolism, 1(1), 5. https://doi.org/10.1186/1743-7075-1-5

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When you engage in resistance training, you subject your muscles to high levels of mechanical tension. This is a stressor. You are essentially telling your body, 'our environment requires considerable physical strength to survive. We are lifting heavy objects; therefore, we cannot afford to lose this muscle tissue'. In response to this stimulus, combined with your protein intake, the body prioritizes muscle preservation above all else.[40] This forces your body to burn stored fat almost exclusively to supply the missing energy.

This mechanical signal works independently of your diet or hormones. This is a physiological reality established by the classic work of Goldberg and colleagues, who showed that muscle growth could still occur in rats that were fasting, diabetic or even had their pituitary glands removed.[41] The mechanical tension was so potent that it overrode the complete absence of anabolic hormones.

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[40] Bryner, R. W., Ullrich, I. H., Sauers, J., Donley, D., Hornsby, G., Kolar, M., & Yeater, R. (1999). Effects of resistance vs. aerobic training combined with an 800 calorie liquid diet on lean body mass and resting metabolic rate. *Journal of the American College of Nutrition*, *18*(2), 115–121. https://doi.org/10.1080/07315724.1999.10718838

[41] Goldberg, A. L., Etlinger, J. D., Goldspink, D. F., & Jablecki, C. (1975). Mechanism of work-induced hypertrophy of skeletal muscle. *Medicine and Science in Sports*, *7*(3), 185–198.

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When overweight or obese adults add any structured resistance program to a diet, they preserve more fat-free mass and strength than those who diet alone.[42] The effect is robust enough to protect even the most vulnerable populations; studies on obese older adults have shown that adding resistance training just three times a week can almost completely prevent diet-induced lean mass loss.[43] Even when energy intake is low, lifting heavy weights signals the body to preserve muscle tissue because it perceives that the muscles are still doing essential work.

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[42] Binmahfoz, A., Dighriri, A., Gray, C., & Gray, S. R. (2025). Effect of resistance exercise on body composition, muscle strength and cardiometabolic health during dietary weight loss in people living with overweight or obesity: A systematic review and meta-analysis. *BMJ Open Sport & Exercise Medicine*, *11*(3), Article e002363. https://doi.org/10.1136/bmjsem-2024-002363; Cava, E., Yeat, N. C., & Mittendorfer, B. (2017). Preserving healthy muscle during weight loss. Advances in Nutrition, 8(3), 511–519. https://doi.org/10.3945/an.116.014506

[43] Frimel, T. N., Sinacore, D. R., & Villareal, D. T. (2008). Exercise attenuates the weight-loss-induced reduction in muscle mass in frail obese older adults. *Medicine & Science in Sports & Exercise*, *40*(7), 1213–1219. https://doi.org/10.1249/MSS.0b013e31816a85ce; Sardeli, A. V., Komatsu, T. R., Mori, M. A., Gáspari, A. F., & Chacon-Mikahil, M. P. T. (2018). Resistance training prevents muscle loss induced by caloric restriction in obese elderly individuals: A systematic review and meta-analysis. Nutrients, 10(4), Article 423. https://doi.org/10.3390/nu10040423

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Without resistance training, even a high-protein diet may not be enough to save all of your muscle during a deficit.[44] The body operates on a 'use it or lose it' principle. If you are restricting calories and not imposing a demand on your muscles, then the body will assume that the muscle is unnecessary bulk. It will break it down to reduce your basal metabolic rate (the amount of energy that you burn at rest). Resistance training prevents this by maintaining or even building muscle while you lose fat.

Moreover, resistance training is what sculpts the physique. Fat loss is a process of revealing, but as we have discussed, resistance training creates what is revealed. If you reduce body fat on a frame that has not been trained, then you reveal bones and soft tissue. If you reduce body fat on a frame that has been subjected to progressive resistance, then you reveal shape and athletic contours. The aesthetic goal that most people describe—defined arms and legs alongside a tapered waist—is a result of muscle being visible through the skin. You cannot just diet your way to those shapes; you also have to build them.

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[44] Kraemer, W. J., Volek, J. S., Clark, K. L., Gordon, S. E., Puhl, S. M., Koziris, L. P., McBride, J. M., Triplett-McBride, N. T., Putukian, M., Newton, R. U., Häkkinen, K., Bush, J. A., & Sebastianelli, W. J. (1999). Influence of exercise training on physiological and performance changes with weight loss in men. *Medicine & Science in Sports & Exercise*, *31*(9), 1320–1329. https://doi.org/10.1097/00005768-199909000-00014

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One need not become a powerlifter or spend three hours a day in the gym to engage in effective resistance training. Resistance training means engaging in physical activity that challenges your muscles against a force. The specifics will be detailed later in chapters 16–19. But the principle can be established now: you cannot merely starve yourself to excellence. You have to build yourself up while you pare yourself down.

6.4. The negotiables: everything else

Once you accept these three pillars, a wonderful thing happens: you gain freedom. You realize that almost everything else in how you approach dieting is negotiable.

First and foremost, the size of the deficit is negotiable. While the presence of a calorie deficit is the non-negotiable first pillar—an unbending law of physics—the size of that deficit is a dial that you control entirely. There is no physiological commandment stating that you must lose weight as quickly as possible to be successful. You are free to choose a steep deficit—which is often the smarter approach, as chapter 9 will argue—or you can opt for a conservative deficit, prioritizing lifestyle flexibility while accepting a slower rate of loss. As long as you are below your maintenance calories—whether by five percent or fifty percent—you are adhering to the fundamental principle. The aggression of

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your diet should be determined by your patience, your psychology, any potential deadlines and your historical success with previous dieting strategies.

The number of meals you eat per day is also negotiable. The data show no measurable metabolic advantage to eating six small meals versus three larger ones.[45] As long as you hit your calorie and protein targets by the end of the day, the frequency is a matter of personal preference and schedule. If you prefer the structure of three square meals, then do that. If you prefer intermittent fasting because it allows you to eat larger, more satisfying meals, then do that. The timing is just a tool to help you adhere to the pillars.

The ratio of carbohydrates to dietary fats, too, is negotiable. Provided that the three pillars are in place, whether you favour a higher-carb diet or a higher-fat diet makes virtually no physiological difference to the total amount of body fat lost. We will explore the nuances of these two macronutrients in greater detail in chapter 11. For now, simply understand that you have the freedom to balance your carbs and fats according to your personal palate and which combination best manages your hunger.

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[45] Schoenfeld, B. J., Aragon, A. A., & Krieger, J. W. (2015). Effects of meal frequency on weight loss and body composition: a meta-analysis. *Nutrition Reviews*, *73*(2), 69–82. https://doi.org/10.1093/nutrit/nuu017

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Food selection is largely negotiable as well. While food quality matters for health and satiety, strictly eliminating entire food groups is rarely necessary for fat loss. You can lose fat eating potatoes and you can lose fat eating rice. You can lose fat as a vegan, a carnivore or an omnivore. You can enjoy a small amount of chocolate or ice cream and still make progress, provided that it fits within your calorie deficit.

Finally, supplements are highly negotiable. The supplement industry is a multi-billion-dollar giant built largely on placebo and hope. Fat burners and miracle pills, along with herbal gimmicks such as detox teas and root extracts, will do nothing if the pillars are not in place. And if the three pillars are in place, then those supplements are largely unnecessary. There are a few that can help around the margins—as detailed in chapter 26—but they are the cherry on the cake.

At this juncture, a reader might observe that adequate sleep was excluded from the three pillars and ask if it, too, is a negotiable variable. I have omitted sleep from the pillars, rightly or wrongly, for two reasons. First, unlike calorie restriction, sufficient protein and resistance training, clinically sufficient sleep is typically an established constant for most people, rather than something that requires active intervention. Second, mild sleep deprivation will not prevent you from losing significant body fat provided that the three

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pillars are secured. However, this does not make adequate sleep highly negotiable; as detailed in chapter 25, adequate sleep is beneficial for preserving lean mass and managing the hormonal environment of a deficit.

These three pillars should empower you to create a strategy that fits your life, rather than twisting your life to fit a rigid and unsympathetic dogma. You can travel, eat out at restaurants and enjoy holidays without derailing your progress, because you understand the fundamental principles. You know that if you control your total energy intake, secure your protein and keep training, then you are winning.

6.5. Final remarks

We have established the hierarchy. A calorie deficit is the primary physiological requirement for weight loss; without it, mass reduction cannot occur. Sufficient protein intake and resistance training control the composition of the weight you lose.

These three elements are the highest-yield investments that you can make for fat loss. They require effort. They benefit from tracking, at least initially. They require showing up to the gym when you are tired and choosing a block of tofu

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when you might prefer a doughnut. But they offer a return on investment that no fad diet can match: predictability.

When you rely on tricks—like cutting out gluten when you do not have coeliac disease or drinking celery juice every morning—you have no recourse when progress plateaus. You cannot identify the cause of the plateau and implement a corrective strategy. But you can when you rely on the three pillars. If progress stalls, then you look at the data. Are you still in a deficit? Has your protein intake slipped? Has your training intensity dropped? You can adjust the dials because you understand the machine.

The remainder of this book is your owner's manual. In the next chapters, we will determine how big your deficit should be to maximize fat loss while minimizing hunger. We will calculate your protein needs based on your lean body mass. We will design a resistance training program that fits your schedule and experience level. We will explore how to use the negotiables to make the process smoother and more enjoyable.

But as we move forward, never lose sight of the fundamentals. When in doubt, return to the pillars. Control your energy. Prioritize your protein. Train your body. Everything else is just details.

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6.6. Key takeaways

- Successful body transformation hinges on three pillars: a calorie deficit (the primary requirement for weight loss), sufficient protein intake and resistance training (both essential for preserving lean mass and improving body composition).
- Once these three core requirements are established, all other diet variables—such as the size of the deficit, meal frequency, carb/fat ratios and supplements—are negotiable and should be adjusted based on personal preference to maximize adherence.

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Chapter 7. Essential and nonessential nutrients

While the thermodynamic reality—energy in versus energy out—governs weight loss, it does not govern survival. You can consume adequate calories and still suffer from malnutrition; conversely, you can aggressively restrict calories and thrive, provided that you meet the body's structural and chemical needs.

Your body requires specific raw materials to survive; these are physiologically essential. However, only a subset of these are nutritionally essential: compounds that cannot be synthesized by the body and therefore must be obtained from your diet. If you fail to provide these, then your body will begin to shut down. Everything else falls into the category of nonessential nutrients; compounds that the body can either manufacture itself or survive without. Understanding this hierarchy is the key to designing a fat-loss phase that is safe and sustainable.

7.1. The cautionary tale of the Last Chance Diet

The starkest illustration of failing to respect essential nutrition is found in the history of the Last Chance Diet. In

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the mid-1970s, a doctor named Robert Linn published a book advocating a Protein-Sparing Modified Fast (PSMF; see chapter 14). The logic was sound in theory: if an obese person has ample body fat, then they do not need to consume carbohydrates or dietary fat for energy. They only need protein to spare their muscle mass while their body fat provides the fuel.

Dr. Linn developed a liquid protein product to accompany the diet. Adherents were consuming fewer than 400 calories a day, composed almost entirely of this liquid supplement. They lost weight rapidly, but then something tragic happened: people started dying. By the late 1970s, the FDA had received reports of over 60 deaths associated with liquid protein diets.[46]

In the autopsy results, the hearts of these unfortunate people showed signs of atrophy; the muscle fibres of the heart had literally been broken down. The issue was a failure to understand essential nutrition. The liquid protein used was derived from collagen—cow hides and connective tissue—which is an incomplete protein. It was deficient in tryptophan and other essential amino acids. Further, the diet

[46] Isner, J. M., Sours, H. E., Paris, A. L., Ferrans, V. J., & Roberts, W. C. (1979). Sudden, unexpected death in avid dieters using the liquid-protein-modified-fast diet: Observations in 17 patients and the role of the prolonged QT interval. *Circulation*, *60*(6), 1401–1412. https://doi.org/10.1161/01.cir.60.6.1401

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failed to provide adequate electrolytes, specifically sodium, potassium and magnesium. Without the full spectrum of essential amino acids, the body could not maintain its vital organs. Without electrolytes, the electrical signalling of the heart failed.

We now know that for a diet to be safe, even at very low calories, it has to provide high-quality protein containing all essential amino acids, along with a complete spectrum of vitamins and minerals.

7.2. The extreme case of Angus Barbieri

To demonstrate the extreme limits of calorie restriction when essential nutrients are provided, we can examine the case study of Angus Barbieri. In 1965, Barbieri, a 27-year-old Scottish man weighing 207 kilograms, undertook a medically supervised fast at Maryfield Hospital in Dundee that lasted 382 days. He concluded the fast weighing 82 kilograms.

Unlike the adherents of the Last Chance Diet, Barbieri neither suffered from heart failure nor died, despite consuming zero conventional meals for over a year. The distinction is in the management of his essential nutrients.

Barbieri's supervising doctors prescribed rigorous daily supplementation of sodium, potassium and a multivitamin.

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He was also administered nutritional yeast, which provided essential amino acids to mitigate the breakdown of lean tissue.

Barbieri possessed a vast reserve of stored energy in the form of his body fat. His body did not require external calories to fuel its basal metabolic rate, as it was able to oxidize his stored body fat. However, because adipose tissue cannot supply minerals, essential amino acids or the full spectrum of essential vitamins, these compounds had to be ingested. By providing only the essential non-caloric requirements, Barbieri's supervising doctors allowed his body safely to use its endogenous fat stores.

While this case study is an extreme outlier and not a viable protocol for the general public, it demonstrates that humans can endure severe, prolonged energy restriction provided that the essential nutrient requirements are met.

Notably, a five-year follow-up showed that Barbieri maintained his weight reduction, stabilizing at 89 kilograms.[47] This challenges the widely accepted necessity of 'slow and steady' weight loss, a dogma that I critically analyse in chapter 9.

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[47] Stewart, W. K., & Fleming, L. W. (1973). Features of a successful therapeutic fast of 382 days' duration. *Postgraduate Medical Journal*, *49*(569), 203–209. https://doi.org/10.1136/pgmj.49.569.203

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7.3. High-quality protein

High-quality protein is essential, and fortunately, it is abundant in the modern food supply. The best sources are complete proteins, meaning that they contain all nine essential amino acids, i.e., the building blocks that the human body cannot synthesize on its own.

For non-vegetarians, lean poultry—such as chicken breast and turkey—has a fantastic protein-to-calorie ratio, making it a staple for fat loss. Lean cuts of red meat provide not just protein, but also haeme iron and B-vitamins. Eggs are very nutritionally rich, though you should be mindful of the calories in the yolk—which is where the fat is found—if you are on a restricted diet. Dairy options such as Greek yoghurt, cottage cheese and whey or casein protein powder deliver highly absorbable protein, while oily fish such as salmon serves a dual purpose by providing protein alongside essential fatty acids. For those avoiding animal products, soy isolates, tofu and carefully combined plant sources will suffice.

While the World Health Organization has established daily requirements for essential amino acids to sustain human life,[48] you do not need a calculator to track them. By simply

[48] World Health Organization, Food and Agriculture Organization of the United Nations, & United Nations University. (2007). *Protein and amino*

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consuming adequate daily protein (see chapter 10) from the sources listed above, you will easily surpass these basic survival thresholds.

7.4. Fluids

Water is arguably the most immediate of all essential nutrients; one can survive for weeks without food but only days without water. In the context of fat loss, water can also be a natural appetite suppressant. The physiological signals for thirst and hunger are often confused. A stomach distended with fluid sends vagal signals of fullness, which can be a powerful volume eating tool (see chapter 23). As well, from a performance standpoint, even mild dehydration of 2% body weight can have a significant impact on strength and endurance.[49] If training intensity drops, then the stimulus to retain muscle mass decreases, compromising the protein-sparing goal of the diet. Fortunately, adequate hydration can be achieved for most by simply drinking to thirst.[50]

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acid requirements in human nutrition: Report of a joint FAO/WHO/UNU expert consultation (WHO Technical Report Series No. 935). World Health Organization.

[49] Sawka, M. N., Burke, L. M., Eichner, E. R., Maughan, R. J., Montain, S. J., & Stachenfeld, N. S. (2007). American College of Sports Medicine position stand. Exercise and fluid replacement. *Medicine and Science in Sports and Exercise*, *39*(2), 377–390. https://doi.org/10.1249/mss.0b013e31802ca597

[50] Valtin, H. (2002). "Drink at least eight glasses of water a day." Really, is there scientific evidence for "8 x 8"? *American Journal of*

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7.5. Electrolytes

Electrolytes are minerals that carry an electrical charge when dissolved in water, primarily sodium, potassium, magnesium, calcium and chloride. Electrolytes regulate nerve transmission, muscle contraction and fluid balance within the cells.

In a standard Western diet, electrolyte deficiency is rare because processed foods are laden with sodium. However, a fat-loss diet—particularly one that is lower in carbohydrates—can drastically change the body's electrolyte management. When insulin levels drop (a natural consequence of restricting calories and carbohydrates), the kidneys switch from retaining sodium to excreting it. As sodium is flushed out, water follows. Together with the mobilization of stored glycogen, this is what explains the rapid water weight drop seen in the first week of dieting. While motivating on the scale, this flush can lead to a state of electrolyte depletion.

The symptoms of this depletion are often mistaken for low blood sugar or general diet fatigue. They include headaches, lethargy, brain fog and muscle cramps. This collection of

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Physiology-Regulatory, Integrative and Comparative Physiology, *283*(5), R993–R1004. https://doi.org/10.1152/ajpregu.00365.2002

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symptoms is frequently referred to as the keto flu, but it is arguably an electrolyte flu.

As noted in the Last Chance Diet tragedy, the absence of sodium, potassium, magnesium and calcium can be fatal. In a less extreme but still meaningful context, electrolyte imbalance ruins gym performance. You cannot lift heavy weights or maintain high-intensity output if your nervous system cannot efficiently signal your muscles to fire.

Maintaining these physiological functions requires specific targets: you require 3 to 5 grams of sodium per day, 1 to 2 grams of potassium per day (often obtained through the use of a salt substitute with added potassium chloride like Lite salt), 300 to 500 milligrams of magnesium per day (taken preferably at night to aid with sleep and muscle relaxation) and 1,000 milligrams of calcium per day.[51]

7.6. Vitamins and trace minerals

With electrolytes addressed, we also need to secure the remaining micronutrients: vitamins and trace minerals.

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[51] Institute of Medicine Committee to Review Dietary Reference Intakes for Vitamin D and Calcium. (2011). *Dietary reference intakes for calcium and vitamin D* (A. C. Ross, C. L. Taylor, A. L. Yaktine, & H. B. Del Valle, Eds.). National Academies Press. https://doi.org/10.17226/13050; Phinney, S. D. (2004). Ketogenic diets and physical performance. *Nutrition & Metabolism*, *1*. https://doi.org/10.1186/1743-7075-1-2

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One challenge of a fat-loss phase is that a reduction in total energy intake simultaneously reduces the total quantity of food through which you can obtain essential vitamins and trace minerals (e.g., B-vitamins, zinc, iron and selenium). This is where the concept of nutrient density becomes paramount. In a deep calorie deficit, every bite should justify its inclusion by delivering these nutrients along with its energy.

Prioritizing nutrient-dense whole foods (and using a high-quality multivitamin as a safety net) helps you maintain overall health and stave off deficiencies while dieting.

7.7. Essential fatty acids

While we can aggressively minimize dietary fat to deepen a calorie deficit, we cannot eliminate it entirely without suffering metabolic consequences. Within the broad category of fats, there exists a small subgroup that the human body cannot manufacture: the Essential Fatty Acids (EFAs). Biologically, we lack the specific enzymes required to insert double bonds into fatty acid chains at the omega-3 and omega-6 positions. Consequently, these specific molecular structures must be ingested, or the body begins to falter.[52]

[52] Gropper, S. S., Smith, J. L., & Carr, T. P. (2021). *Advanced nutrition and human metabolism* (8th ed.). Cengage Learning.

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However, treating omega-6 and omega-3 as equally pressing concerns is a mistake. The modern food environment is saturated with omega-6 fatty acids (linoleic acid), and human adipose tissue typically retains a fulsome reservoir of them, often enough to last a year or more.[53] The dietetic bottleneck, and the focus of this section, is the intake of omega-3 fatty acids, specifically the long-chain forms known as EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid).

A mere 400 to 500 milligrams of omega-3 per day suffices for basic survival, but as we will see in §26.7, the threshold for health is higher. For optimal health and performance, I argue that one should aim for a daily intake of 2 to 4 grams of combined EPA and DHA. Generally, smaller people or women may target the lower end of this spectrum, while larger people or men may aim for the upper limit.

Achieving this dosage through diet alone is theoretically possible but logistically difficult. The most potent source is fatty, cold-water fish like salmon or mackerel, which can deliver up to 3.0 grams of EPA/DHA per modest serving. However, the standard advice to consume fish twice a week

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[53] Guyenet, S. J., & Carlson, S. E. (2015). Increase in adipose tissue linoleic acid of US adults in the last half century. *Advances in Nutrition*, *6*(6), 660–664. https://doi.org/10.3945/an.115.009944

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falls short of the daily amount required for optimal intakes. Further, attempts to source omega-3s from enriched eggs or pasture-raised meats are generally futile; the cost-to-yield ratio is poor, and the total fat calories required to get adequate omega-3s from these sources would likely obliterate a fat-loss calorie budget.

A common pitfall for the plant-based dieter is the reliance on sources like flaxseed or hemp oil. These contain Alpha-Linolenic Acid (ALA), a precursor molecule. The human body has to convert ALA into usable EPA and DHA, a process that is notoriously inefficient.[54] The conversion rate is so low that one would need to consume copious caloric amounts of flax oil to yield a clinically relevant amount of DHA. Therefore, direct consumption of preformed EPA/DHA—derived from fish or algae—is the only reliable method.

For most, this necessitates supplementation. Here, vigilance in reading the Supplement Facts panel is mandatory. A standard 1,000 mg fish oil capsule often contains mostly filler oil and as little as 300 mg of active EPA/DHA. Relying on such low-grade generic supplements would require swallowing nearly a dozen pills daily to reach a 4.0-gram

[54] Anderson, B. M., & Ma, D. W. L. (2009). Are all n-3 polyunsaturated fatty acids created equal? *Lipids in Health and Disease*, *8*, 33. https://doi.org/10.1186/1476-511x-8-33

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target. A smarter approach is to seek out double-strength formulations where the concentration of EPA/DHA is 600 mg or higher per capsule, requiring only a few pills a day. Alternatively, liquid fish oils can provide ample doses (over 1.5 grams) in a single teaspoon, which makes them efficient for those who can tolerate the taste and texture.

For optimal quality, these oils should be treated as perishable goods. Polyunsaturated fats are unstable and prone to oxidation. Rancid fish oil is pro-inflammatory; the opposite of the desired effect. To guarantee purity and freshness, you should ensure that your fish oil is IFOS-certified (International Fish Oil Standards) and states a TOTOX (Total Oxidation) value below 10. Once sourced, supplements should be stored in the refrigerator to maintain their chemical integrity; this has the secondary benefit of minimizing gastric regurgitation or fish burps.

Finally, the inclusion of these fats keeps the gallbladder active. During aggressive dieting, the lack of dietary fat can cause bile to sit stagnant in the gallbladder, thickening into sludge and eventually forming stones. The ingestion of fats stimulates the gallbladder to contract and empty, which mitigates this risk while simultaneously facilitating the absorption of fat-soluble vitamins (A, D, E and K).

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7.8. The role of fibre and vegetables

Technically, fibre is not an essential nutrient in the acute sense; you will not die without it in the way that you would without water or electrolytes. However, it is still beneficial, especially while on a fat-loss diet.

When food intake is low, digestion slows down. The physical bulk of food decreases, which can lead to constipation. Fibrous vegetables provide the roughage necessary to maintain motility in the gastrointestinal tract.

Vegetables are also instrumental in keeping you full. They are one of the only food groups with high volume for negligible calories. As we will see in chapter 23, a stomach that is physically stretched triggers mechanoreceptors that signal the brain to stop eating. Trying to endure a calorie deficit on low-volume, calorie-dense foods is a battle of willpower that few win. A large bowl of green vegetables induces gastric distension, which suppresses the hunger response without significantly increasing total calorie intake.

Further, vegetables help to deliver micronutrients. While you can take a multivitamin, the utilization of minerals and

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vitamins in food may be superior.[55] The phytochemicals found in plants also play a role in oxidative stress management.[56] Fat loss is a stressor on the body; releasing stored fatty acids seems to release stored toxins and increase oxidative load.[57] The antioxidants in vegetables may therefore help to mitigate this cellular stress.

To secure the associated benefits of gut health and satiety, a practical target for most dieters is between 25 and 35 grams of fibre per day.[58]

7.9. The nonessentials: carbohydrates

Physiologically, there is no such thing as an essential carbohydrate. The human body requires glucose for certain functions, particularly for the brain and red blood cells, but it

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[55] Thiel, R. J. (2000). Natural vitamins may be superior to synthetic ones. *Medical Hypotheses*, *55*(6), 461–469. https://doi.org/10.1054/mehy.2000.1090

[56] Liu, R. H. (2003). Health benefits of fruit and vegetables are from additive and synergistic combinations of phytochemicals. *The American Journal of Clinical Nutrition*, *78*(3), 517S–520S. https://doi.org/10.1093/ajcn/78.3.517S

[57] Chevrier, J., Dewailly, É., Ayotte, P., Mauriège, P., Després, J.-P., & Tremblay, A. (2000). Body weight loss increases plasma and adipose tissue concentrations of potentially toxic pollutants in obese individuals. *International Journal of Obesity*, *24*(10), 1272–1278. https://doi.org/10.1038/sj.ijo.0801380

[58] Barber, T. M., Kabisch, S., Pfeiffer, A. F. H., & Weickert, M. O. (2020). The health benefits of dietary fibre. *Nutrients*, *12*(10), 3209. https://doi.org/10.3390/nu12103209

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does not require dietary glucose. The liver is capable of a process called gluconeogenesis, where it creates glucose from non-carbohydrate sources, specifically from lactate, pyruvate, glucogenic amino acids and the glycerol backbone of triglycerides.[59]

This means that a person can survive indefinitely without consuming a single gram of carbohydrate, provided that protein and fat intake are adequate. This biological fact is the premise behind ketogenic diets. However, labelling carbohydrates as nonessential does not mean that they are useless. Carbohydrates replenish glycogen stores, and are therefore beneficial for performance. High-intensity anaerobic activity—like lifting heavy weights or sprinting—runs primarily on glycolytic pathways. While the body can adapt to use ketones and fats for fuel, top-end explosive performance often degrades without glycogen.[60]

One way to treat carbohydrates is as something to have more or less of depending on your training. They can be placed around training windows to support the intensity of exercise, which in turn spares muscle tissue. If one is sedentary, then

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[59] Gropper, S. S., Smith, J. L., & Carr, T. P. (2021). *Advanced nutrition and human metabolism* (8th ed.). Cengage Learning.
[60] Gawelczyk, M. (2026). Effects of low-carbohydrate and ketogenic diets on anaerobic performance in competitive athletes: A systematic review and meta-analysis. *Nutrients*, *18*(10), 1589. https://doi.org/10.3390/nu18101589

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the need for this nonessential nutrient drops to near zero. If one is an athlete, then the need increases. But unlike protein and essential fats, if you miss out on carbohydrates, then no structural damage occurs. You may feel flat or lethargic, but you are not malnourished. This distinction allows us to slash carbohydrate intake aggressively to create a calorie deficit without risking health, making them a primary variable to manipulate in a fat loss plan.

7.10. The nonessentials: dietary fats other than omega-3 and omega-6 fatty acids

As discussed, while specific fatty acids (omega-3 and omega-6) are essential, the majority of dietary fat is nonessential. It is simply a dense source of energy. One gram of fat provides nine calories, more than double that of protein or carbohydrates.

In a fat-loss phase, the objective is to force the body to use its stored fat for energy. Consequently, consuming large amounts of dietary fat is counterproductive. Every gram of fat that you eat is a gram of fat that your body does not need to burn from its reserves.

This is often a point of confusion for those following low-carb or ketogenic diets. They assume that because they are in ketosis, they can consume unlimited butter and oil.

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While ketosis has been shown to blunt hunger,[61] energy balance still applies. If you consume 3,000 calories of fat, then your body will burn that dietary fat and leave your body fat untouched. Therefore, in a fat loss setup, dietary fats can be kept low (e.g., just enough to cover essential needs, but no more).

7.11. The anti-nutrient: alcohol

Finally, we address alcohol. It is unique in that it is functionally an anti-nutrient, i.e., it impairs the absorption of essential vitamins and minerals while depleting the body's existing nutrient stores to process it.[62] It is seven calories per gram—sitting between carbohydrates and fats in terms of energy density—but it is of little nutritional value. There are no proteins, vitamins or minerals in alcohol; only energy. Further, as a source of liquid calories, alcohol bypasses the

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[61] Gibson, A. A., Seimon, R. V., Lee, C. M. Y., Ayre, J., Franklin, J., Markovic, T. P., Caterson, I. D., & Sainsbury, A. (2015). Do ketogenic diets really suppress appetite? A systematic review and meta-analysis. *Obesity Reviews*, *16*(1), 64–76. https://doi.org/10.1111/obr.12230; Sumithran, P., Prendergast, L. A., Delbridge, E., Purcell, K., Shulkes, A., Kriketos, A., & Proietto, J. (2013). Ketosis and appetite-mediating nutrients and hormones after weight loss. *European Journal of Clinical Nutrition*, *67*(7), 759–764. https://doi.org/10.1038/ejcn.2013.90

[62] Butts, M., Sundaram, V. L., Murughiyan, U., Borthakur, A., & Singh, S. (2023). The Influence of Alcohol Consumption on Intestinal Nutrient Absorption: A Comprehensive Review. *Nutrients*, *15*, 1571. https://doi.org/10.3390/nu15071571

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body's normal satiety signals, meaning that it is easy to overconsume without registering fullness (see §23.4).

However, the calorie content and ease of overconsumption are not the only problems. Alcohol disinhibits feeding behaviour. It lowers resolve and increases appetite, often leading to overeating episodes that can erase a week's worth of calorie deficit in a single night.[63] It also disrupts sleep, creating a hormonal environment that is hostile to fat loss and muscle preservation.[64] While it is possible to lose weight while consuming moderate amounts of alcohol if a calorie deficit is maintained, it is swimming upstream. It adds unsatiating, unproductive calories, degrades sleep and challenges adherence. In a hierarchy of nutrients for fat loss, alcohol is at the very bottom; it is nonessential and actively hinders the process.

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[63] Yeomans, M. R. (2010). Alcohol, appetite and energy balance: Is alcohol intake a risk factor for obesity? *Physiology & Behavior*, *100*(1), 82–89. https://doi.org/10.1016/j.physbeh.2010.01.012

[64] Ebrahim, I. O., Shapiro, C. M., Williams, A. J., & Fenwick, P. B. (2013). Alcohol and sleep I: Effects on normal sleep. *Alcoholism: Clinical and Experimental Research*, *37*(4), 539–549. https://doi.org/10.1111/acer.12006; Parr, E. B., Camera, D. M., Areta, J. L., Burke, L. M., Phillips, S. M., Hawley, J. A., & Coffey, V. G. (2014). Alcohol ingestion impairs maximal post-exercise rates of myofibrillar protein synthesis following a single bout of concurrent training. *PLoS One*, *9*(2), e88384. https://doi.org/10.1371/journal.pone.0088384

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7.12. Key takeaways

- Nutritionally essential compounds cannot be synthesized by the body and must be consumed, whereas nonessential nutrients can be manufactured internally or are not required for survival.
- Extreme energy restriction is only safe when essential nutrient requirements are strictly met, as evidenced by the safety risks of the Last Chance Diet versus the successful outcomes of Angus Barbieri's medically supervised 382-day fast.
- The table below outlines essential and nonessential nutrient requirements:

Nutrient	Status	Actionable target
Protein	Essential	See chapter 10.
Fluids (water)	Essential	Drink to thirst.

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Electrolytes	Essential	Sodium: 3–5 g daily. Potassium: 1–2 g daily. Magnesium: 300–500 mg (at night). Calcium: 1,000 mg.
Vitamins and trace minerals	Essential	Take a multivitamin and maximize nutrient density; avoid 'empty' calories.
Essential fatty acids	Essential	2–4 g of combined EPA/DHA daily, ideally via high-concentration fish oil.
Fibre and vegetables	Nonessential, but wise to emphasize while dieting	25–35 g of fibre daily.

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Carbohydrates	Nonessential	Not required for survival.
Dietary fats other than omega-3 and omega-6 fatty acids	Nonessential	Not required for survival.
Alcohol	Anti-nutrient	Avoid, as it actively hinders the fat loss process.

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Chapter 8. Determining maintenance calories

The term maintenance calories refers to the precise number of calories that you need each day to maintain your weight. Technically, you do not need to know your maintenance calories to lose body fat. If you were to slash your intake drastically—e.g., by doing a Protein-Sparing Modified Fast (PSMF; see chapter 14)—then you would lose fat regardless of whether you know your maintenance calories or not.

While fat loss can occur through random restriction, knowing your maintenance intake grants you predictability and lets you plan an exit strategy.

Fat loss is governed by a predictable linear relationship: for every kilogram of fat that you wish to lose per week, a specific calorie deficit is required.

- Do you want to lose 0.5 kg (1.1 lb) of fat per week? You need a daily deficit of ~550 calories.
- Do you want to lose 1.0 kg (2.2 lb) of fat per week? You need a daily deficit of ~1,100 calories.[65]

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[65] Wishnofsky, M. (1958). Caloric equivalents of gained or lost weight. *The American Journal of Clinical Nutrition*, *6*(5), 542–546. https://doi.org/10.1093/ajcn/6.5.542

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You cannot solve this equation if you do not know what you are subtracting from. Knowing your maintenance calorie intake lets you subtract from it the necessary calories to lose fat at the rate you desire.

Knowing your maintenance also gives you a landing strip. You will not be dieting forever. When the diet ends, it helps to have a precise calorie target to return to so that you can stop losing weight without immediately rebounding into a surplus. If you never calculated your maintenance intake, then you will be left guessing how much food to add back in. But by knowing this number, you know what your intake should be when the diet is over.

8.1. The moving target problem

NEAT—described in chapter 4—is highly adaptive. When you introduce a calorie deficit, your body senses a fuel shortage. Its evolutionary survival mechanism is to downregulate movement to conserve energy. You may find yourself fidgeting less and moving more slowly, while spending more of your day sitting. There are ways to mitigate this—for example, by consciously maintaining your pre-diet daily step count, a practice detailed in §15.6—but some unconscious reduction in overall movement is common.

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Further, your TEF—the energy your body uses to digest and process meals—drops solely as a consequence of calorie restriction. Because TEF accounts for roughly 10% of your total intake, eating less naturally means that you burn less during digestion. For example, simply introducing a 500-calorie deficit automatically results in a ~50-calorie drop in daily TEF.

Consequently, your maintenance calorie requirement is a dynamic variable; the maintenance calories calculated in a state of energy balance will likely go down once you are dieting.

If your maintenance is 2,800 calories today, and you start a diet tomorrow, then your maintenance might immediately drop to 2,600 simply because your NEAT and TEF go down. If you calculated your deficit based on the 2,800 number, then your rate of loss will be slower than predicted.

Therefore, the number we find in this chapter is just your maintenance *right now*. As you progress, you will update this value based on your observed rate of loss, allowing for precise adjustments to your calorie intake. This will ensure that your rate of loss stays where you want it to be.

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8.2. My two preferred methods to determine maintenance calories

A mistake some trainees make is relying solely on online BMR calculators or wearable fitness trackers. These tools use population averages (like the Harris-Benedict or Mifflin-St Jeor equations) to estimate your metabolic rate.

While these equations are useful starting points, they have a standard error margin of roughly 10 to 15 percent.[66] This means that for the average person, a calculator can easily be off by 150 to 300 calories in either direction. Further, at the outer edges of the bell curve, two people of the same height, weight, age and gender can have maintenance levels that differ by up to 500 calories.

If a calculator estimates your maintenance at 2,500 calories, but your actual maintenance is 2,100, then setting a standard 500-calorie deficit means that you will be eating 2,000 calories a day. Instead of losing a pound of fat a week, you are in a microscopic 100-calorie deficit.

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[66] Frankenfield, D. C., Roth-Yousey, L., & Compher, C. (2005). Comparison of predictive equations for resting metabolic rate in healthy nonobese and obese adults: A systematic review. *Journal of the American Dietetic Association*, *105*(5), 775–789. https://doi.org/10.1016/j.jada.2005.02.005

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To triangulate your maintenance, there are two methods that I like to use with clients: (1) the two-week maintenance test; and (2) the test-as-you-go method.

8.2.1. Method A: the two-week maintenance test

The two-week maintenance test, as the name implies, requires a two-week investment where the singular focus is data collection, not weight loss. The process begins with a rough estimate to get you in the ballpark. I recommend using the Mifflin-St Jeor equation (see §8.4) to find this number, though if you prefer a quick and dirty approximation, then you can simply multiply your body weight in kilograms by 30 to 33. For a 90 kg lifter, this might place the starting pin somewhere between 2,700 and 3,000 calories. Once this number is set, you lock the variables down. For the next 14 days, you will consume this calorie amount every single day, with no 'cheat meals' and absolute strictness in weighing and tracking every gram of food (chapter 21 details how to do this). Simultaneously, you will weigh yourself every morning after using the toilet but before consuming any food or water.

On day 15, you will calculate the average weight of week 2 and compare it against the average of week 1 (chapter 27 details how to do this). If your average weight remained stable—fluctuating no more than 0.1 to 0.2 kg—then you have successfully identified your maintenance. However, if

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the average trended up, then you are likely in a surplus; if it trended down, then you are likely in a deficit.

Fortunately, we can estimate that gap. Although this is a slight oversimplification, you can assume that every 0.1 kg of weekly weight change equals an approximate 110-calorie daily discrepancy.[67] So, if you gained 0.4 kg on average each week, then you can assume that you were in a daily ~440-calorie surplus, meaning that your maintenance is your intake minus that amount. Conversely, if you lost 0.5 kg on average, then you can assume that you were in a daily ~550-calorie deficit. Running the two-week test will not give you a flawless gauge of your maintenance intake—nothing outside of a laboratory will—but it lets you set your deficit with high confidence.

It is worth noting that you can extend this phase for longer than two weeks for greater accuracy. In fact, two weeks might not be enough time for people who menstruate. If your body weight fluctuates predictably with your menstrual cycle, then a 14-day window may capture a false trend. In these cases, you may need a longer time period so that you

[67] As discussed in chapter 3, scale weight changes are a composite of adipose tissue, body water, glycogen stores and gastrointestinal volume. Therefore, equating every 100 grams of scale weight to 770 calories of tissue is inexact.

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can compare weekly averages across similar phases of your cycle to calculate your maintenance accurately (see §27.2.3).

8.2.2. Method B: the test-as-you-go method

The test-as-you-go method allows you to begin fat loss immediately. Rather than pausing to test your maintenance, you can derive it from your rate of weight loss while you diet. To begin, you need a starting calorie target that puts you in a likely deficit; a Protein-Sparing Modified Fast (PSMF; see chapter 14) would definitely fall into this category, though a standard estimator such as multiplying your body weight in kilograms by 26 is also sufficient. For a 90 kg male, this results in 2,340 calories. You simply begin eating this amount immediately.

You need to be patient during the initial phase. You cannot determine your maintenance accurately based on the first week of a diet. When you suddenly drop calories and carbohydrates, your body sheds a lot of water and glycogen, often resulting in a loss of 2 to 3 kg in the first seven days alone. If you were to plug this rapid drop into a calculator, then it would produce a false signal, suggesting that your maintenance is upward of 5,000 calories. You should diet through this noise phase for one week to allow fluid balance to stabilize, continuing to collect data but refraining from any analysis.

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By week 2, the initial flush is over, and you can treat your average weight for this week as your reference weight. From this point forward, the weight coming off is primarily tissue. You can now determine your Total Daily Energy Expenditure (TDEE) by tracking your average weight over a set timeframe—typically a two- to three-week block—and calculating your average weekly rate of loss.

Use this equation:

$$TDEE = average\ daily\ intake + \left(\frac{reference\ weight - current\ weight}{number\ of\ weeks}\right) \times 1100$$

Example:

- Week 2 average (reference): 90.0 kg.
- Week 4 average (current): 89.0 kg.
- Timeframe: 2 weeks.
- Calculation: (90.0 - 89.0) / 2 = 0.5 kg lost per week.
- Daily deficit: 0.5 kg × 1,100 = 550 calories.
- Average daily intake: 2,340 calories.
- **TDEE (maintenance):** 2,340 (intake) + 550 (deficit) = **2,890 calories**.

If you are consuming an average of 2,340 calories and losing an average of 0.5 kg per week, then you can use the formula to calculate your maintenance: a 0.5 kg weekly loss of fat

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requires a 550-calorie daily deficit. By adding that deficit back to your intake (2,340 + 550), you calculate that your maintenance is 2,890 calories.

As you get leaner, your maintenance will likely drop. When you constantly track your weekly averages, you can review any recent 14- or 21-day block and recalculate your maintenance.

Later in the diet, you may check your last two weeks of data and find that your rate of loss has slowed to 0.25 kg per week. That 0.25 kg loss is only a ~275-calorie deficit, meaning that your maintenance has slid down to 2,615 calories (2,340 intake + 275 deficit). You can then adjust your intake downward to re-establish your desired rate of loss.

As with the two-week maintenance test, the test-as-you-go method will not give you a flawless gauge of your maintenance calories.[68] However, it is more than accurate enough for our purposes.

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[68] The test-as-you-go formula is slightly inaccurate because it relies on the assumption that all lost weight is body fat, which is almost certainly not the case. Measuring from week two onward makes it likelier that you are tracking primarily fat loss, but you are still losing a combination of both fat and lean body mass. Therefore, the actual deficit required to drop 0.5 kg on the scale each week can be slightly less than 550 calories daily.

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8.2.3. Which approach is for you?

On paper, the test-as-you-go method gives you the best of both worlds. It grants you precision without requiring you to pause your progress. You capture the necessary data while you shed body fat, making it the logical choice for those who prioritize efficiency. Nevertheless, there are circumstances where the slower pace of the two-week maintenance test is a viable alternative. The decision rests on your experience level and your psychological relationship with the scale.

You should consider opting for the two-week maintenance test if you are a novice to tracking macronutrients. If you have never weighed food before, then attempting to learn these skills (see chapter 21) while enduring the hunger of a deficit can be burdensome and demoralizing; the two-week maintenance test allows you to develop accuracy in a relatively low-stress environment. It is also the prescription for those with a history of yo-yo dieting. If you have spent years cycling between starvation and bingeing, then you may benefit from a period of time to repair your relationship with food before the stress of a deficit is introduced (indeed, in these circumstances, the two-week timeline can and should be extended for as long as it takes until you feel stable and in control of your eating habits). Further, if you are prone to anxiety regarding whether you are cutting too hard or not

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enough, then the two-week maintenance test will help by removing all doubt before you begin.

8.3. Your personal maintenance multiplier

Regardless of which method you choose, the effort you invest in calculating your maintenance yields a permanent dividend. Once you have determined your true Total Daily Energy Expenditure (TDEE), you can derive your very own shorthand maintenance-calorie multiplier.

The maths are straightforward: divide your calculated maintenance calories by your current body weight in kilograms.

Example:

- Current weight: 90.0 kg
- Calculated maintenance: 2,890 calories
- The calculation: 2,890 / 90 = 32.1 kcal/kg

Your personal maintenance multiplier is 32. This number is a custom-fit metric, unique to your BMR and NEAT.

Why does this matter? Because the next time you decide to diet—whether it is following a prolonged muscle-building phase or after a year of simply living at maintenance—you do not have to start from scratch or endure another two-week

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maintenance test. You simply take your new body weight and multiply it by 32 to find out your updated maintenance calories instantly.

If you spend a year building your physique and step on the scale at 95 kg, then your new starting maintenance is simply 95 × 32 (3,040 calories). From there, you can immediately subtract your desired deficit and begin cutting.

While this multiplier may become less accurate if your lifestyle changes drastically (e.g., transitioning from an active job to a desk job) or if you substantially alter your ratio of muscle to body fat, it will always be a better and more individualized starting point than any generic formula you will find on the internet.

8.4. Calculating maintenance calories using the Mifflin-St Jeor equation

Published in 1990, the Mifflin-St Jeor equation is currently the most accurate predictive equation for modern populations.[69] This formula calculates your BMR, which you

[69] Frankenfield, D. C., Roth-Yousey, L., & Compher, C. (2005). Comparison of predictive equations for resting metabolic rate in healthy nonobese and obese adults: A systematic review. Journal of the American Dietetic Association, 105(5), 775–789. https://doi.org/10.1016/j.jada.2005.02.005; Mifflin, M. D., St Jeor, S. T., Hill, L. A., Scott, B. J., Daugherty, S. A., & Koh, Y. O. (1990). A new

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can then multiply by an activity factor to establish your estimated maintenance calories.

For men:

$$BMR = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) + 5$$

For women:

$$BMR = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) - 161$$

Once you have calculated your BMR using this formula, you multiply the result by the activity level that best describes your daily routine. Be honest with your assessment here; overestimating your activity level is a primary reason why these calculators fail.

- Sedentary (little or no exercise, desk job): BMR × 1.2
- Lightly active (light exercise or sports 1–3 days a week): BMR × 1.375
- Moderately active (moderate exercise or sports 3–5 days a week): BMR × 1.55

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predictive equation for resting energy expenditure in healthy individuals. *The American Journal of Clinical Nutrition*, *51*(2), 241–247. https://doi.org/10.1093/ajcn/51.2.241

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- Very active (hard exercise or sports 6–7 days a week): BMR × 1.725
- Extra active (very hard exercise and a highly physical job): BMR × 1.9

If we return to our example of a 90 kg male lifter, then assuming that he is 25 years old, 180 cm tall and engages in moderate exercise (a 1.55 multiplier), we can calculate his maintenance using the Mifflin-St Jeor equation.

First, we calculate his BMR:

$$BMR = (10 \times 90) + (6.25 \times 180) - (5 \times 25) + 5$$

$$BMR = 900 + 1125 - 125 + 5$$

$$BMR = 1{,}905 \text{ calories}$$

Second, we calculate his TDEE using the activity multiplier:

$$\text{Maintenance} = 1{,}905 \times 1.55$$

$$\text{Maintenance} = 2{,}952.75 \text{ calories}$$

This calculation gives our lifter a starting point of ~2,950 calories. He can now use this number confidently to initiate

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either the two-week maintenance test or the test-as-you-go method to pinpoint his maintenance.

8.5. Key takeaways

- Determining your true maintenance calories (TDEE) is valuable for control and predictability. It allows you to set a precise daily deficit for a target rate of fat loss and gives you a landing strip to prevent a post-diet rebound.
- Generic calculators are a good starting point but can be inaccurate; TDEE is better established by tracking your data either through a two-week maintenance test or by a test-as-you-go method.

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Chapter 9. Gradual versus rapid fat loss

Few myths in nutrition are quite so entrenched as the idea that weight should be lost slowly. The prevailing assumption is that if you lose weight rapidly—often labelled with the derogatory term crash dieting—then four bad things will happen: (1) you will lose muscle instead of fat; (2) your metabolism will crash as your body fights back; (3) you will develop nutrient deficiencies; and (4) you will feel miserable and quit, leading to the yo-yo effect where you gain it all back. This slow-and-steady mantra has been repeated so often that it has practically become an article of faith in the fitness industry, viewed as a biological safety limit.

However, new science suggests that losing weight quickly might not only be safe but more effective for long-term success.

9.1. The psychology of dieting: why speed helps you stick to it

To understand why rapid fat loss is gaining favour, we should turn our attention to the greatest adversary in any transformation: the human mind. The traditional model of slow weight loss assumes that human willpower is a

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renewable resource that can be sustained indefinitely. It asks you to endure a state of deprivation for months, sometimes years, to achieve a goal. While a modest deficit is theoretically easier to adhere to on a day-to-day basis because it allows for more food, it extends the duration of the psychological stress. This is often referred to as diet fatigue. The longer you are in a deficit, the more opportunities life has to get in the way. Weddings, holidays, stress at work and simple boredom all chip away at compliance.

This is where the psychology of speed is helpful. There is a valuable motivational power in seeing visible results immediately. Data consistently show that people who lose the most weight in the first few weeks of an intervention are the ones most likely to achieve their long-term goals and ultimately maintain that weight loss years later.[70]

Consider the findings from Nackers and colleagues at the University of Florida. They found that women who lost weight at a fast rate (more than 0.68 kg or 1.5 lbs per week) were five times more likely to achieve a clinically significant 10% weight loss within 18 months compared to the slow

[70] Astrup, A., & Rössner, S. (2000). Lessons from obesity management programmes: Greater initial weight loss improves long-term maintenance. *Obesity Reviews*, *1*(1), 17–19. https://doi.org/10.1046/j.1467-789x.2000.00004.x

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group.[71] This was corroborated by the Purcell study published in *The Lancet Diabetes & Endocrinology*, which pitted a 12-week rapid weight loss group against a 36-week gradual group. The results were stark: 81% of the rapid group achieved their target weight compared to only 50% of the gradual group.[72] Further, data from the large-scale Look AHEAD trial—which followed over 2,000 participants—demonstrated that those who lost the most weight in the first two months were the most likely to have maintained significant weight loss eight years later.[73]

It is difficult to isolate definitively whether the rapid protocol itself drives this long-term adherence or if highly motivated people simply excel at both phases. However, it would seem that the mechanism here is a positive feedback loop. When you make a sacrifice—skipping dessert, measuring your lean

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[71] Nackers, L. M., Ross, K. M., & Perri, M. G. (2010). The association between rate of initial weight loss and long-term success in obesity treatment: does slow and steady win the race? *International Journal of Behavioral Medicine*, *17*(3), 161–167. https://doi.org/10.1007/s12529-010-9092-y

[72] Purcell, K., Sumithran, P., Prendergast, L. A., Bouniu, C. J., Delbridge, E., & Proietto, J. (2014). The effect of rate of weight loss on long-term weight management: a randomised controlled trial. *The Lancet Diabetes & Endocrinology*, *2*(12), 954–962. https://doi.org/10.1016/S2213-8587(14)70200-1

[73] Unick, J. L., Neiberg, R. H., Hogan, P. E., Cheskin, L. J., Dutton, G. R., Jeffery, R., Johnson, K. C., Pahor, M., Pi-Sunyer, X., & Wing, R. R. (2015). Weight change in the first 2 months of a lifestyle intervention predicts weight changes 8 years later. *Obesity*, *23*(7), 1353–1356. https://doi.org/10.1002/oby.21112

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proteins, hitting the gym when you are tired—you want to see a return on that investment. When the scale drops by two or three kilograms in the first ten days, the feedback loop is closed. Your hard work is paying off. This surge of dopamine and satisfaction reinforces the behaviour, effectively gamifying the process. Conversely, grinding away for four weeks to lose a single kilogram can feel like a poor return on investment, leading to discouragement and eventual abandonment of the plan.

9.2. How rapid fat loss provides resilience against slip-ups

No matter how dedicated you are to a transformation, slip-ups—an unplanned dessert at an office party, a few drinks on a weekend or simply caving to a late-night craving—are hard to avoid. Under the traditional model of slow weight loss, these minor transgressions can be devastating.

Consider the margins of a gradual diet. If you are operating on a modest deficit of 250 calories a day to lose roughly a quarter of a kilogram per week, then your total weekly deficit is 1,750 calories. If you experience a moment of weakness on Saturday and consume an extra 2,000 calories—which is easily done with a single restaurant meal and a couple of drinks—then you have instantly wiped out

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your entire week's deficit. Stepping on the scale on Monday morning and seeing no progress, or even a slight gain, after six days of flawless discipline is immensely demoralizing. This frequently triggers what psychologists call the 'what the hell' effect: the dieter assumes that all their hard work is ruined, throws their hands up and abandons the plan entirely.

A rapid fat loss protocol, however, provides a larger margin for imperfect adherence. If you are operating on a much larger deficit—say, 1,500 calories a day, aiming for a weekly deficit of 10,500 calories—then that same 2,000-calorie slip-up stings, but it does not derail you. Your weekly deficit simply goes from 10,500 to 8,500 calories. When you step on the scale at the end of the week, you will still see a notable drop in weight.

Because rapid fat loss creates such a large deficit, your progress is resilient to the occasional misstep. You are still rewarded with a net positive result on the scale, which mitigates the guilt and keeps you on the program. Instead of quitting, you simply wake up the next day, return to the plan and keep moving forward.

9.3. Why stricter diets feel easier

A common fear regarding rapid fat loss is the assumption that hunger will scale linearly with the size of the deficit. The

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logic follows that if a 500-calorie deficit makes you hungry, then a 1,000-calorie deficit will make you twice as hungry again and bring you close to starving. However, appetite regulation is far more complex than simple caloric maths. There is a phenomenon often observed in clinical practice where people actually report less hunger on a stricter, more aggressive plan than on a moderate one.[74]

This paradox can be attributed to (1) the elimination of decision fatigue; and (2) sensory-specific satiety, i.e., the phenomenon whereby your appetite diminishes when you are restricted to a monotonous flavour profile but is restimulated by the introduction of new tastes and textures. Moderate diets often encourage flexible dieting, where you fit small treats into your daily allowance. While this sounds psychologically freeing, it can keep the palate excited and cravings active. A stricter, rapid-fat-loss phase often relies on a narrower selection of satiating foods: lean proteins and fibrous vegetables. When you remove hyper-palatable trigger foods entirely, the brain's reward system calms down.[75]

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[74] Brennan, I. M., Seimon, R. V., Luscombe-Marsh, N. D., Otto, B., Horowitz, M., & Feinle-Bisset, C. (2010). Effects of acute dietary restriction on gut motor, hormone and energy intake responses to duodenal fat in obese men. *International Journal of Obesity*, *35*(3), 448–456. https://doi.org/10.1038/ijo.2010.153

[75] Parylak, S. L., Koob, G. F., & Zorrilla, E. P. (2011). The dark side of food addiction. *Physiology & Behavior*, *104*(1), 149–156. https://doi.org/10.1016/j.physbeh.2011.04.063

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Further, on very low-calorie intakes, particularly those low in carbohydrates, the body produces ketone bodies. These molecules, used for energy in the absence of glucose, have a documented appetite-suppressing effect.[76]

It is essential, however, to distinguish between a structured rapid-fat-loss plan and a crash diet. A crash diet is unstructured chaos: a cabbage soup diet, a juice cleanse or simply starving oneself. These approaches fail because they lack the essential nutrients required to sustain biological function. A structured rapid-fat-loss phase—such as the properly executed PSMF approach, detailed in chapter 14—is a targeted, evidence-based intervention. It prioritizes nutrient density, which ensures that while calories are low, the intake of protein, vitamins, minerals and essential fatty acids remains high.

9.4. Do faster rates of weight loss crash your metabolism?

There is no compelling evidence that an aggressive deficit inflicts unique or permanent damage to your metabolism compared to a gradual approach. The magnitude of metabolic adaptation is determined primarily by the total

[76] Stubbs, B. J., Cox, P. J., Evans, R. D., Cyranka, M., Clarke, K., & de Wet, H. (2017). A ketone ester drink lowers human ghrelin and appetite. *Obesity*, *26*(2), 269–273. https://doi.org/10.1002/oby.22051

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amount of weight lost, not the speed at which it is lost.[77] Whether you lose 10 kilograms over ten weeks or twenty weeks, the resulting dip in your metabolic rate at your new body weight will be similar. An aggressive diet simply accelerates the timeline, arriving at that inevitable physiological adaptation sooner.

9.5. Do faster rates of weight loss cause more muscle loss?

One of the most pervasive arguments against rapid fat loss is the fear of muscle catabolism. Some claim that the body has a strict physiological limit to how much fat it can liberate per day (often cited as roughly 30 calories per pound of body fat). The theory posits that once you surpass this limit, the body is forced to burn muscle tissue to cover the remaining energy deficit.

However, while studies comparing rapid versus gradual weight loss often show that the absolute amount of Lean Body Mass (LBM) lost is higher in rapid groups, this metric is deceptive. LBM is not synonymous with contractile tissue (muscle); it includes water, glycogen, connective tissue, bone

[77] Coutinho, S. R., Halset, E. H., Gåsdal, Ø., Hunter, A. H., Kulseng, B., & Martins, C. (2018). The impact of rate of weight loss on body composition and compensatory mechanisms during weight reduction: A randomized control trial. *Clinical Nutrition*, *37*(4), 1154–1160. https://doi.org/10.1016/j.clnu.2017.04.008

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mineral and the bulk within your digestive tract. Aggressive dieting depletes glycogen stores and sheds water weight rapidly. Therefore, much of the 'muscle' lost on a scale during a crash diet is simply fluid and stored carbohydrates.

A 2022 meta-analytic review of 13 studies (comparing weight loss rates from 0.2 to 3.2 kg/week) found that while faster weight loss sometimes caused more fat-free mass loss during the active diet, these differences largely disappeared after 2–4 weeks at a stable lower weight. Once glycogen and intracellular water are replenished during a maintenance phase, the LBM discrepancy vanishes. Further, the researchers noted that the speed of the initial weight loss did not affect the total amount of weight regained long-term, nor did it change whether that regained weight was stored as fat or LBM.[78]

Assuming that sufficient protein and resistance training are in place, I remain unconvinced that aggressive diets increase the risk of muscle loss. But even if we were to concede the premise that aggressive deficits slightly increase the risk of muscle loss, there is still a distinct advantage to speed: time. A slow, gradual cut keeps the body in a catabolic

[78] Fogarasi, A., Gonzalez, K., Dalamaga, M., & Magkos, F. (2022). The impact of the rate of weight loss on body composition and metabolism. *Current Obesity Reports*, *11*(2), 64–75. https://doi.org/10.1007/s13679-022-00468-2

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(breakdown) state for months on end. A rapid cut gets the fat off quickly, allowing the athlete to return to maintenance or a surplus phase sooner. Any lost muscle can quickly be regained. Male bodybuilders who incorporate bulking and cutting cycles may slowly bulk from 12% body fat up to 15%, then cut back down to 12%; female bodybuilders may bulk from 21% up to 24%, then cut back down to 21%. Over the course of a calendar year, the athlete who cuts quickly may actually spend less total time in a catabolic state than the athlete who cuts slowly, potentially leading to higher net muscle accretion.

9.6. Rapid fat loss and diet breaks

Even with the best nutrition and training protocols, an aggressive diet often becomes hard to sustain. Rapid fat loss is best executed in short-term sprints. A structured plan might involve an aggressive deficit for 2 to 6 weeks—speeding through the fat-loss phase while motivation is high—followed by a diet break where calories are brought back to 5–10% below maintenance. This approach helps to normalize the hormones that control hunger (leptin and ghrelin) and gives you a mental break before you engage in another sprint. We will explore the practical application of this strategy—specifically how to time your sprints and schedule your breaks—in chapter 28.

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9.7. What can go wrong?

While the benefits of speed are compelling, we cannot be blind to the physiological risks. Rapid fat loss places a higher demand on the body's filtration and regulatory systems. A notable risk is the formation of gallstones. When you lose fat rapidly, the liver secretes extra cholesterol into the bile, and the gallbladder may not empty as frequently if fat intake is very low. This supersaturation can lead to crystallization and stones. This is why intelligent rapid fat loss protocols should include a minimum amount of dietary fat (10–20 grams per day, of which 3–6 grams should consist of fats from a high-concentration fish oil or algae oil) to aid bile flow.[79]

As detailed in chapter 7, electrolyte imbalances are another common pitfall. When insulin levels drop—as they do in a deficit—the kidneys excrete sodium, and water follows. This is exacerbated by the fact that low-carbohydrate diets are inherently lower in electrolytes, having eliminated many mineral-rich staple foods. If these electrolytes—sodium, potassium, magnesium and calcium—are not replaced, then the dieter can experience fatigue, brain fog, muscle cramps and headaches, often referred to as the keto flu.

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[79] Gebhard, R. L., Prigge, W. F., Ansel, H. J., Schlasner, L., Ketover, S. R., Sande, D., Holtmeier, K., & Peterson, F. J. (1996). The role of gallbladder emptying in gallstone formation during diet-induced rapid weight loss. *Hepatology*, *24*, 544–548. https://doi.org/10.1002/hep.510240313

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Finally, in very severe cases—historically observed in concentration camp survivors, or in profound clinical malnutrition like marasmus and kwashiorkor—there is the risk of refeeding syndrome. This is a potentially fatal derangement of fluids and electrolytes that occurs when chronically starved people are reintroduced to food too quickly. Today, this is primarily a risk for people recovering from long-term anorexia nervosa or extreme alcoholism. However, because it requires severe malnourishment, refeeding syndrome is exceedingly rare in the context of general population dieting.

9.8. Final remarks

The era of 'slow and steady is the only way' is ending. Today, we know that speed is not the enemy; carelessness is (specifically, neglecting protein and essential nutrients or doing too much, too little or the wrong kind of training).

For most people, the psychological victory of seeing the body change rapidly is a major predictor of adherence. The feedback loop of hard work yielding visible results creates a momentum that slow dieting cannot match. Further, high protein intakes and heavy lifting can circumvent the physiological penalties that used to be associated with crash dieting.

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Gradual weight loss still has its place, particularly for those who prefer more flexibility in their lifestyle or those training for peak athletic performance where every calorie counts for recovery. But for the general population looking to shed body fat, the new science is liberating: you do not have to suffer for years to get the body that you want. You can choose to sprint.

9.9. Key takeaways

- New evidence suggests that rapid weight loss is more effective for long-term weight maintenance than the traditional slow-and-steady approach.
- Speed is a powerful psychological tool; the early responder effect creates an immediate positive feedback loop, which is a major predictor of long-term diet adherence and prevents diet fatigue.
- Aggressive deficits (e.g., a 1,500-calorie deficit) are a powerful buffer against caloric slip-ups, preventing the minor transgression from wiping out the entire weekly deficit.
- Stricter, rapid fat loss plans often result in less overall hunger than moderate diets, primarily due to reduced decision fatigue and the appetite-suppressing effects of ketone bodies.

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- When the total weight loss is equated, rapid weight loss does not crash your metabolism any more than gradual weight loss does.
- While rapid protocols show higher Lean Body Mass (LBM) loss on the scale, this is largely water/glycogen. A key advantage of rapid protocols is the reduced total time spent in a catabolic state, which may lead to higher net muscle accretion over the long term.
- Rapid fat loss is often best used as a structured sprint (2–6 weeks) followed by a planned diet break to reset hormones and prevent burnout, while physiological risks (gallstones, electrolyte imbalances) must be managed with essential nutrient intake.

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Chapter 10. Protein requirements for fat loss

A central objective of any fat-loss phase is to protect lean body mass. The primary lever we have to influence this quality of weight loss, aside from resistance training, is dietary protein.

10.1. The MPS/MPB seesaw

We know from chapter 6 that a deficit invites muscle loss, but we have not looked under the hood at how.

At a cellular level, your muscle tissue is never static. It exists in a dynamic equilibrium between two opposing forces: Muscle Protein Synthesis (MPS), the building of new tissue, and Muscle Protein Breakdown (MPB), the degradation of old tissue. Under normal conditions, these forces cancel each other out.

A calorie deficit disrupts this seesaw. The scarcity of energy triggers a hormonal cascade—dropping insulin and spiking cortisol—that suppresses MPS and elevates MPB. Your body is building less muscle than usual and tearing it down faster than usual to scavenge amino acids for glucose (gluconeogenesis).

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This is why consuming enough protein is important. The amino acid leucine initiates the signalling pathway that stimulates MPS to counteract the deficit-driven drop, effectively restoring the anabolic response that the calorie restriction reduced.[80]

10.2. Why standard guidelines fail

Standard nutritional guidelines for protein have typically hovered around the Recommended Dietary Allowance (RDA) of 0.8 grams per kilogram of body weight per day. However, the RDA is designed to prevent deficiency in sedentary populations, not to optimize body composition in active people, and certainly not to preserve muscle tissue during an energetic famine.[81]

Relying on the RDA while dieting likely does not preserve muscle mass optimally. This was demonstrated by Pasiakos

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[80] Pasiakos, S. M., Margolis, L. M., & Orr, J. S. (2014). Optimized dietary strategies to protect skeletal muscle mass during periods of unavoidable energy deficit. *The FASEB Journal*, *29*, 1136–1142. https://doi.org/10.1096/fj.14-266890; Stokes, T., Hector, A., Morton, R., McGlory, C., & Phillips, S. (2018). Recent perspectives regarding the role of dietary protein for the promotion of muscle hypertrophy with resistance exercise training. *Nutrients*, *10*, 180. https://doi.org/10.3390/nu10020180

[81] Phillips, S. M., Chevalier, S., & Leidy, H. J. (2016). Protein "requirements" beyond the RDA: Implications for optimizing health. *Applied Physiology, Nutrition, and Metabolism*, *41*(5), 565–572. https://doi.org/10.1139/apnm-2015-0550

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and colleagues in a randomized controlled trial. When participants were subjected to a 40% calorie deficit, those strictly adhering to the RDA (0.8 g/kg) lost a significant amount of lean body mass. In contrast, participants consuming double (1.6 g/kg) or triple (2.4 g/kg) the RDA were able to preserve their fat-free mass and maintain higher rates of muscle protein synthesis, suggesting that the adequate amount for survival is inadequate for retention.[82]

10.3. Why leaner people need more protein

One of the most counterintuitive aspects of protein requirements is the relationship between body fat and muscle protection. Conventional logic might suggest that a heavier person needs more protein because they have more mass to support. However, biological reality suggests the opposite. The leaner you are, the more protein you need to consume to protect the muscle you have.

Body fat is an energy reserve. When a person with high body fat restricts calories, the body has an abundant supply of free fatty acids to mobilize for fuel. Because energy flow from adipose tissue is high, the body feels less pressure to

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[82] Pasiakos, S. M., Cao, J. J., Margolis, L. M., Sauter, E. R., Whigham, L. D., McClung, J. P., Rood, J. C., Carbone, J. W., Combs, G. F., Jr., & Young, A. J. (2013). Effects of high-protein diets on fat-free mass and muscle protein synthesis following weight loss: A randomized controlled trial. *The FASEB Journal*, *27*(9), 3837–3847. https://doi.org/10.1096/fj.13-230227

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scavenge amino acids from muscle tissue for energy. The fat stores effectively spare the muscle.

However, as you get leaner, this buffer erodes. A lean person has fewer fat stores to draw upon. As body fat percentages drop into the athletic or essential ranges, the body perceives a greater threat to its survival. The availability of lipid energy (i.e., energy from fat) decreases, and the body increasingly turns to protein—and thus muscle tissue—to meet its energy demands. This was illustrated in a study by Elia and colleagues examining the differences in fat, carbohydrate and protein metabolism between lean and obese subjects undergoing total starvation. The researchers demonstrated that during prolonged starvation, lean people experience protein loss and oxidation rates that are two to three times higher than those seen in obese people, alongside higher rates of urinary nitrogen excretion.[83] This suggests that as your body fat decreases, your dietary protein intake should increase to offset the body's growing tendency to burn muscle for fuel.

[83] Elia, M., Stubbs, R. J., & Henry, C. J. K. (1999). *Differences in fat, carbohydrate, and protein metabolism between lean and obese subjects undergoing total starvation*. Obesity Research, *7*(6), 597–604. https://doi.org/10.1002/j.1550-8528.1999.tb00720.x

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10.4. On the impact of deficit severity

The magnitude of the calorie deficit may play a mediating role in determining dietary protein requirements. Some literature suggests that as the energy deficit increases, protein intakes should increase to compensate.

This interaction was outlined in a 2014 systematic review by Helms and colleagues. The researchers analysed body composition outcomes across multiple cohorts of energy-restricted, resistance-trained athletes. Their findings suggested that protein needs under calorie restriction are substantially higher than at maintenance, estimating an optimal range of 2.3 to 3.1 grams per kilogram of Fat-Free Mass (FFM). The authors concluded that this requirement scales upward in proportion to both the leanness of the person and the severity of the calorie restriction.[84]

This is corroborated by a 2018 review by Hector and Phillips examining protein recommendations for weight loss in athletic populations. While establishing a general optimal intake range of 1.6 to 2.4 grams per kilogram of total body weight per day, the authors highlighted that more severe

[84] Helms, E. R., Zinn, C., Rowlands, D. S., & Brown, S. R. (2014). A systematic review of dietary protein during caloric restriction in resistance trained lean athletes: a case for higher intakes. *International Journal of Sport Nutrition and Exercise Metabolism*, *24*(2), 127–138. https://doi.org/10.1123/ijsnem.2013-0054

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calorie deficits result in greater losses of lean body mass. Consequently, they argued that to mitigate the heightened potential for catabolism during aggressive dieting phases, it may be beneficial to push a person's protein intake up to that upper boundary.[85]

10.5. The impact of activity

Every time you lift weights, you impose significant mechanical tension on your muscles and accelerate the rate of protein turnover. This physiological stress creates an increased demand for exogenous amino acids to drive muscle protein synthesis and facilitate tissue repair.[86] If this elevated requirement is not met through your diet, then the body may enter a negative protein balance and catabolize its own lean tissue to source the necessary building blocks. Consequently, the protein intake deemed adequate for a sedentary person may be insufficient for an athlete.

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[85] Hector, A. J., & Phillips, S. M. (2018). Protein recommendations for weight loss in elite athletes: A focus on body composition and performance. *International Journal of Sport Nutrition and Exercise Metabolism*, *28*(2), 170–177. https://doi.org/10.1123/ijsnem.2017-0273

[86] Phillips, S. M., Tipton, K. D., Aarsland, A., Wolf, S. E., & Wolfe, R. R. (1997). Mixed muscle protein synthesis and breakdown after resistance exercise in humans. *American Journal of Physiology-Endocrinology and Metabolism*, *273*(1), E99–E107. https://doi.org/10.1152/ajpendo.1997.273.1.E99

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10.6. Finding a concrete daily target

When it comes to translating these physiological principles into a daily target, you have two choices. You can base your protein intake on your total body weight—the simpler, more common approach—or you can base it on your Lean Body Mass (LBM), which is my preferred method.

10.6.1. Basing your protein on your total body weight

For a resistance-trained person in a calorie deficit, a widely recommended range for muscle retention is 2.0 to 2.4 grams of protein per kilogram of total body weight (roughly 0.9 to 1.1 grams per pound).

This range is supported by meta-analytic data. For instance, Morton and colleagues analysed the impact of dietary protein on resistance-trained people and found that while average requirements may plateau lower at 1.6 g/kg, the upper 95% confidence interval for maximizing muscle retention and growth extends to 2.2 g/kg.[87]

[87] Morton, R. W., Murphy, K. T., McKellar, S. R., Schoenfeld, B. J., Henselmans, M., Helms, E., Aragon, A. A., Devries, M. C., Banfield, L., Krieger, J. W., & Phillips, S. M. (2018). A systematic review, meta-analysis and meta-regression of the effect of protein supplementation on resistance training-induced gains in muscle mass and strength in healthy adults. *British Journal of Sports Medicine*, *52*(6), 376–384. https://doi.org/10.1136/bjsports-2017-097608

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This range is further supported by the International Society of Sports Nutrition (ISSN), whose position stand on protein and exercise is that while lower intakes in the range of 1.4–2.0 g/kg may suffice at maintenance, people in a hypocaloric (deficit) state may require higher intakes—even scaling as high as 3.1 g/kg—to maximize the retention of lean body mass.[88]

From here, you can slide your intake up or down based on the three variables we just discussed: your body fat percentage, the severity of your deficit and the nature of your training.

- Slide toward the higher end (2.0 to 3.0 g/kg) if you are already very lean (under 15% body fat for men, 24% for women) or if you are running a severe calorie deficit.
- Slide toward the lower end (1.4 to 2.0 g/kg) if you have a higher body fat percentage, if your calorie deficit is mild or if you are not engaging in resistance training.

There is one caveat to this method: if you have a significant amount of body fat to lose (e.g., >25% for men or >35% for women), then scaling protein to your total body weight yields

[88] Jäger, R., Kerksick, C. M., Campbell, B. I., Cribb, P. J., Wells, S. D., Skwiat, T. M., ... & Antonio, J. (2017). International Society of Sports Nutrition Position Stand: protein and exercise. *Journal of the International Society of Sports Nutrition*, *14*(1), 20.

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excessive targets. In this scenario, a simple workaround is to use your *goal* body weight instead. For example, a 130 kg person aiming for 90 kg would use 90 kg as the basis for the equation (90 kg × 2.2 g/kg), dropping their requirement from a bloated 286 grams to a more manageable 198 grams per day.

10.6.2. Basing your protein intake on your lean body mass

When working with clients, I typically use a lean body mass-based approach. It requires some calculations which I usually perform on the backend so that my clients do not have to, but it is fairly straightforward.

To use this method, you first estimate your body fat percentage (see §10.6.2.2) and then subtract your fat mass from your total weight. For example, a 90 kg person with 20% body fat carries 18 kg of fat; therefore, their lean body mass is 72 kg. It is this number that determines your protein intake.

Once you have established your lean body mass, you apply the appropriate multiplier. One up-to-date multiplier comes from a meta-regression published by Refalo and colleagues. The researchers suggested that to minimize the loss of lean tissue during a calorie deficit, a solid target for

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resistance-trained people is 2.5 grams of protein per kilogram of lean body mass. For our hypothetical 90 kg person with 72 kg of lean mass, this yields a target of 180 grams of protein per day.

However, the researchers also found that the benefits do not strictly plateau at 2.5 g/kg of lean body mass. Intakes pushed even higher—scaling up to roughly 4.2 g/kg of lean body mass—were linearly associated with even greater lean mass retention. While this more-is-generally-better relationship may matter for elite competitors, the researchers noted that the overall difference in effect size between the lowest and highest protein intakes was statistically 'small'.

This analysis suggests that hitting that 2.5 g/kg of lean body mass threshold is sufficient to mitigate the majority of lean mass loss. If you are hovering around this number, then you are capturing most of the benefits.[89]

As with the total body weight-based targets, this 2.5 g/kg of lean body mass figure can be scaled up or down to match your body fat percentage, the severity of your deficit and your activity level:

[89] Refalo, M. C., Trexler, E. T., & Helms, E. R. (2025). Effect of dietary protein on fat-free mass in energy restricted, resistance-trained individuals: An updated systematic review with meta-regression. *Strength & Conditioning Journal*. Advance online publication. https://doi.org/10.1519/ssc.0000000000000888

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- Slide toward the higher end (2.5 to 4.0 g/kg of lean body mass) if you are already very lean (under 15% body fat for men, 24% for women) or if you are running a severe calorie deficit.
- Slide toward the lower end (1.5 to 2.5 g/kg of lean body mass) if you have a higher body fat percentage, if your calorie deficit is mild or if you are not engaging in resistance training.

10.6.2.1. Why I prefer basing protein intake on lean body mass

I prefer basing protein intake on lean body mass because it scales your intake better to the tissue that actually requires amino acids: your muscle mass. Going by total body weight is a blunt instrument. While it works passably for people of average body composition, it breaks down at the extremes. As discussed, if a severely overweight person calculates their target using their total body weight, then they will end up with an absurdly high, impractical protein goal. Conversely, a very light, lean, muscular person using a standard multiplier might inadvertently under-eat protein relative to the amount of contractile tissue that they need to sustain.

By that same token, the total body weight method frequently overestimates the requirements for women. Because women naturally—and healthily—carry a higher percentage of

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essential and storage body fat than men, a larger portion of their scale weight is composed of tissue that does not influence protein requirements.

To illustrate the flaw in the total body weight model, ask yourself this question: if you hypothetically woke up tomorrow with 20 kilograms of additional body fat, then would your physiological protein needs really skyrocket to support it? Of course not. Fat mass does not require a constant influx of dietary protein to maintain its structure.

10.6.2.2. Calculating your body fat percentage

In an ideal world, we would all have access to clinical-grade Dual-Energy X-ray Absorptiometry (DEXA) scans. In the real world, these are expensive, inconvenient and expose you to small amounts of radiation. Bioelectrical Impedance Analysis (BIA) scales—the ones that you stand on in your bathroom—are convenient but unreliable; their readings can swing wildly based on whether you drank a glass of water or had a salty dinner the night before. Skinfold callipers are accurate in the hands of a skilled technician, but if you are pinching yourself, then user error is almost guaranteed.

The best compromise for trainees without access to sophisticated equipment is the US Navy method.

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Developed by the military to ensure that their personnel met fitness standards, this method is based on a series of circumference measurements plugged into an algorithm. It has been shown to be surprisingly consistent and often more accurate than consumer-grade BIA devices.[90] All you need is a flexible tape measure and a mirror.

How to measure:

- Neck: measure the circumference of the neck. For men, measure just below the larynx (Adam's apple). For women, measure at the mid-neck. Keep the tape flat and tight enough to touch the skin but not compress it.

- Abdomen/waist:
    - *Men*: measure the circumference of the abdomen at the level of the navel (belly button).
    - *Women*: measure the waist circumference at the narrowest point, usually halfway between the navel and the bottom of the sternum.

- Hips (women only): measure the circumference of the hips at the widest part of the buttocks.

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[90] Hodgdon, J. A., & Friedl, K. E. (1999). *Comparison of circumference- and skinfold-based body fat estimation equations* (Report No. NAHRC-99-10). Naval Health Research Center.

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- Height: measure your height without shoes.

Once you have these raw numbers, do not attempt to do the maths yourself; the formula involves logarithmic calculations that are tedious to perform by hand.[91] Simply search for a 'US Navy body fat calculator' online, plug in your measurements and use the result to determine your body fat percentage.

10.7. On the costs and benefits of going higher than the theoretical optimum amount of protein

Having established a robust theoretical optimum for muscle retention—such as 2.5 g/kg of lean body mass—a logical question arises: is there any utility in pushing intakes even higher? Some athletes scale their protein higher during aggressive cutting phases and deciding whether to adopt this strategy requires a careful analysis of the physiological, psychological and pragmatic trade-offs.

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[91] For men, it looks like this:

$$\%BF = 495 / (1.0324 - 0.19077 \times \log10(\text{waist in cm} - \text{neck in cm}) + 0.15456 \times \log10(\text{height in cm})) - 450$$

For women, it looks like this:

$$\%BF = 495 / (1.29579 - 0.35004 \times \log10(\text{waist in cm} + \text{hip in cm} - \text{neck in cm}) + 0.22100 \times \log10(\text{height in cm})) - 450$$

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Recalling §6.2, the benefits of pushing protein beyond the standard optimum include: (1) a higher thermic effect of food to increase energy expenditure subtly; (2) enhanced satiety; (3) a protective effect on the athlete's mood; and (4) an extra layer of insurance for muscle retention.

However, these benefits should be weighed against several very real costs. One issue is that a calorie budget during a fat-loss phase is strictly finite. Because you are operating within a fixed daily calorie limit, macronutrient allocation is a zero-sum game. Every additional gram of protein costs four calories. Therefore, pushing your protein intake higher inherently forces the displacement of other macronutrients. If you allocate a large portion of your limited calorie budget to protein, then you are forced to remove dietary fats—which can compromise hormonal function and meal palatability—or reduce carbohydrates, which may impair your training performance.

Further, there is a literal financial cost to consider. Protein is universally the most expensive macronutrient per gram. When you combine the dollar cost of the food, the displacement of other macronutrients and the diminishing returns that higher intakes yield, pushing protein to the extreme upper limits often means paying a premium for a marginal benefit.

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While the 2.5 g/kg of lean body mass figure is a reasonable starting point, you may find that the mood enhancement and appetite suppression of a hyper-elevated protein intake make the diet infinitely more sustainable, or you may find the financial and caloric trade-offs to be an unnecessary burden. The goal of weighing these trade-offs is to design your own personal fat loss toolkit, i.e., identify the strategies that allow you to adhere to a deficit with minimum discomfort.

10.8. Falling short of these protein targets

For some, the volume of chicken, egg whites and tofu required to hit these protein targets is nauseating. Alternatively, you may simply prefer to allocate more of your restricted calorie budget to carbohydrates to fuel your training sessions or to dietary fats to make your meals enjoyable.

At a certain point, your dietary setup requires a pragmatic cost-benefit analysis. You have to ask yourself: is the psychological and physical discomfort of forcing down an additional fifty grams of unpalatable protein worth the fractional percentage of lean tissue it might theoretically save?

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Often, the answer is no. When assessing this trade-off, remember that dietary protein is only one half of the muscle-retention equation. Resistance training itself provides a powerful anabolic signal. The mechanical tension generated by lifting heavy weights is the primary physiological shield against catabolism. As long as you are training with sufficient intensity, that stimulus alone signals the body to preserve contractile tissue, even if your amino acid availability is slightly suboptimal.

If you fall short of the theoretical optimum, then you are not losing muscle at a catastrophic rate. Further, thanks to the biological advantage of muscle memory, any minor amount of tissue sacrificed during a diet is rapidly reclaimed the moment you return to caloric maintenance or a surplus. Perfection is not a prerequisite for an excellent physique; intense training paired with consistency within a good enough protein range will still get you most of the way there.

10.9. Protein requirements at maintenance and surplus

You must understand that the aggressive numbers listed above are the wartime requirements of a deficit. They are designed to counteract the catabolic environment of starvation. However, when you transition to

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peacetime—eating at maintenance or in a calorie surplus (bulking)—your protein requirements decrease.

When the body has a surplus of carbohydrates and fats to meet its fuel demands, it treats protein less as an energy source and uses it more for structural repair and growth. Because the body becomes more efficient with protein when calories are high, you do not need to consume as much to achieve the same anabolic effect.

That said, there is no physiological penalty for keeping your protein intake elevated. In fact, many athletes choose to maintain their wartime protein targets even after the diet ends. Keeping protein high preserves the satiety you relied upon during the cut and maintains established dietary habits for the sake of consistency. This may reduce the risk of overeating and slipping into an unintended calorie surplus.

However, if you wish to free up more of your calorie budget for carbohydrates and fats, then you can safely scale your protein back to 1.4–2.0 g/kg of total body weight upon transitioning out of your fat-loss phase. Alternatively, to calculate your maintenance/surplus requirements using Lean Body Mass (LBM), you can aim for roughly 1.8–2.4 g/kg of LBM.

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10.10. How to hit protein targets without relying solely on supplements

You do not need to rely on liquid supplements to reach these protein targets consistently. Instead, you can redesign the menu of normal meals to achieve the necessary results.

In standard Western dieting, protein is often treated as a component of the meal, sharing equal (or lesser) billing with carbohydrates and fats. For the physique athlete in a deficit, a useful measure is the 50/50 rule, where you aim to have at least half of the physical volume of your plate occupied by a lean protein source. Meat eaters wishing to maximize the protein-to-calorie ratio of their diet should prioritize white proteins such as chicken breast, turkey mince, egg whites and white fish like cod or barramundi. Vegan dieters can rely on soy or pea-and-rice protein isolates. These sources allow you to ingest large amounts of protein without paying the fat tax associated with cuts like ribeye steak or chicken thighs.

You can also increase your protein intake with substitutions. This involves replacing carbohydrate-heavy or fat-heavy pantry staples with high-protein alternatives that serve the same culinary purpose. For example, plain Greek yoghurt is texturally similar to sour cream but adds 10 to 15 grams of protein per serving, whereas the fat-based original adds none. Similarly, swapping white rice for legume-based

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alternatives like lupin flakes or high-protein pasta can double or triple the trace protein you receive from your sides or base.

To prevent decision fatigue, it also makes sense to embrace meal prep strategies. Cooking 40 grams of protein from scratch every time hunger strikes is a recipe for eventually succumbing to convenience foods. Grilling one to two kilograms of lean protein in advance every Sunday ensures that slicing cold, pre-cooked protein into salads or wraps takes fewer than three minutes. For moments when even that feels like too much effort, lean dairy products like low-fat cottage cheese and Greek yoghurt are the fast food of the bodybuilding world. They require zero preparation and are a slow-digesting casein source, creating a sustained release of amino acids.

If you find yourself unable to chew another whole chicken breast or solid block of tempeh, then you can use food processing to eat the same protein with less discomfort. Ground meats, crumbled extra-firm tofu and shredded or pulled textures are easier to consume in large quantities than whole fillets or slabs, because they do not require so much mastication. If you are really struggling, then I would also advise against enforcing a strict no-powder rule. A whey isolate powder, or a well-formulated plant-based pea-and-rice blend, can be stirred into oatmeal or yoghurt or

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baked into recipes. Alongside liquid bases like pasteurized egg whites or silken tofu, these powders can fortify smoothies and sauces invisibly, bumping a meal's protein content by thirty to forty grams without adding much physical bulk or gastrointestinal distress.

10.11. The myth of the anabolic ceiling

A pervasive myth in nutrition circles is the idea of a strict anabolic ceiling per meal. For years, gym lore and even some academic literature suggested that the human body can only use 20 to 40 grams of protein in a single sitting for muscle synthesis. The belief was that any protein consumed beyond this threshold would be wasted (either oxidized for energy or converted to fat).[92] This led to the obsessive behaviour of eating small, frequent meals every three hours to 'keep the anabolic fire burning'.

However, recent research has discovered that this ceiling is illusory. A study by Trommelen and colleagues, published in *Cell Reports Medicine*, used a sophisticated quadruple isotope tracer feeding-infusion approach to examine the

[92] This is contextually true for whey protein given by itself, which is where the oxidation was originally seen. However, this is simply a function of amino acids hitting the bloodstream too quickly, a dynamic that does not apply to any other situation. Whole food proteins and mixed meals containing fats or fibre significantly slow down digestion, resulting in a steady, prolonged release of amino acids over many hours.

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body's response to ingesting 100 grams of protein in a single meal compared to 25 grams. The results suggested that the anabolic response to protein ingestion has no apparent upper limit in magnitude or duration.

When the participants ingested 100 grams of protein, they did not simply oxidize the excess. Instead, the large bolus of protein resulted in a prolonged release of amino acids into the circulation and a sustained elevation of muscle protein synthesis that lasted for more than 12 hours.[93] The researchers found a dose-response increase in the prolonged incorporation of dietary protein into muscle tissue; essentially, a larger single dose of protein sustained muscle protein synthesis for longer than a smaller dose. Effectively, the study debunked the idea that 'excess' amino acids in a single meal are merely burned off.

This implies that total daily protein intake is far more important than per-meal distribution. If you prefer to eat one or two big meals rather than six small ones, then you are not shortchanging your gains. The body is evolutionarily designed to handle large feasts; it simply slows down digestion and absorbs the amino acids over a longer period.

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[93] Trommelen, J., van Lieshout, G. A., Nyakayiru, J., Holwerda, A. M., Smeets, J. S., Hendriks, F. K., ... & van Loon, L. J. (2023). The anabolic response to protein ingestion during recovery from exercise has no upper limit in magnitude and duration in vivo in humans. *Cell Reports Medicine*, *4*(12), 101324. https://doi.org/10.1016/j.xcrm.2023.101324

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10.12. Protein quality: not all sources are created equal

While quantity is the primary driver, the source of your protein plays a supporting role. Protein quality is generally determined by its amino acid profile—specifically the presence of Essential Amino Acids (EAAs) and the leucine content—and its bioavailability. As discussed in chapter 7, animal proteins, such as meat, dairy, eggs and fish, are generally considered to be high quality because they are complete proteins. They contain all nine essential amino acids in ratios that closely mirror human muscle tissue requirements, and they are typically rich in leucine, a primary trigger for muscle protein synthesis.

Plant proteins, by contrast, are often incomplete, meaning that they may lack or be low in one or more essential amino acids. However, achieving a complete amino acid profile is still highly manageable as a plant-based athlete. Soy protein, for instance, is a complete, highly bioavailable plant source. For those using other sources, incorporating a diverse intake of different plant sources across the day—such as mixing grains with legumes—will provide a complementary profile of amino acids, giving the body all of the building blocks that it needs. This is where a high-quality pea-and-rice protein blend goes a long way. Because pea protein is rich in lysine but deficient in methionine, and rice protein is the inverse,

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combining them yields a complete amino acid profile that closely rivals animal-based protein in its ability to drive muscle protein synthesis.

10.13. Are high protein intakes safe?

Whenever high protein intakes are discussed, the spectre of safety concerns arises, usually centred on kidney health and bone density. The current scientific consensus is that a high protein intake is not harmful to the kidneys of healthy people.[94] The kidney strain myth originated from patients with pre-existing renal disease, who indeed need to limit protein. For a healthy person, the kidneys are perfectly capable of filtering the byproducts of protein metabolism. Similarly, the concern that protein causes bone loss (by leaching calcium) has been largely disproven.[95] In fact, adequate protein intake increases intestinal calcium absorption and stimulates Insulin-like Growth Factor 1

[94] Devries, M. C., Sithamparapillai, A., Brimble, K. S., Banfield, L., Morton, R. W., & Phillips, S. M. (2018). Changes in kidney function do not differ between healthy adults consuming higher- compared with lower- or normal-protein diets: A systematic review and meta-analysis. *The Journal of Nutrition*, *148*(11), 1760–1775. https://doi.org/10.1093/jn/nxy197

[95] Kerstetter, J. E., O'Brien, K. O., & Insogna, K. L. (1998). Dietary protein affects intestinal calcium absorption. *The American Journal of Clinical Nutrition*, *68*(4), 859–865. https://doi.org/10.1093/ajcn/68.4.859

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(IGF-1), which promotes bone growth.[96] Protein appears to protect the skeleton just as it protects the muscle.

10.14. Key takeaways

- The main role of dietary protein is to protect lean body mass by stimulating Muscle Protein Synthesis (MPS) to counteract the deficit-driven drop in the muscle-building/breakdown balance (MPS/MPB).
- Protein requirements are best calculated using Lean Body Mass (LBM) rather than total body weight.
- A robust, evidence-based target for muscle retention in resistance-trained people is 2.5 grams of protein per kilogram of LBM.
- This LBM-based target should be scaled downward or upward depending on your leanness, deficit severity, activity level, budget and personal preferences.
- The belief in a 20–40 g 'anabolic ceiling' per meal is false; total daily protein intake is more important than meal frequency, as the body can sustain muscle synthesis for over 12 hours from a large bolus.
- At maintenance or in a surplus, protein can be safely scaled back (e.g., 1.4–2.0 g/kg of total body weight) to free up calories for carbohydrates and fats.

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[96] Bonjour, J. P. (2005). Dietary protein: an essential nutrient for bone health. *Journal of the American College of Nutrition*, *24*(sup6), 526S–536S. https://doi.org/10.1080/07315724.2005.10719501

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Chapter 11. Carbohydrates and fats

The macronutrients carbohydrates and dietary fats are often either vilified or worshipped depending on the current trend. But when we examine rigorously controlled metabolic ward studies, as we did in chapter 6—where participants are monitored in a lab and every calorie is strictly counted—we see that when protein is kept high, the ratio of carbohydrates to fats makes virtually no difference in the amount of body fat lost.[97]

Because the physiological outcome is the same, my primary concern as a consultant is your psychological experience. We have social lives paired with our own distinct cravings and palates. The best diet is the one that you can stick to on a busy Tuesday night.

If you are someone who loves steak, avocados, nuts and eggs, and you find that a higher-fat approach keeps your hunger at bay, then we lean into that. If the idea of giving up fruit or starchy favourites such as rice and bread makes you want to quit dieting entirely, then we build your plan with more

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[97] Hall, K. D., Chen, K. Y., Guo, J., Lam, Y. Y., Leibel, R. L., Mayer, L. E., Reitman, M. L., Rosenbaum, M., Smith, S. R., Walsh, B. T., & Ravussin, E. (2016). Energy expenditure and body composition changes after an isocaloric ketogenic diet in overweight and obese men. *The American Journal of Clinical Nutrition*, *104*, 324–333. https://doi.org/10.3945/ajcn.116.133561

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carbohydrates and less fat. You are only married to the calorie deficit and protein; we adjust the carbs and fats to make that deficit as comfortable as possible.

Nevertheless, you will often hear arguments that extreme drops in either carbohydrates or fats will ruin your workouts and crash your endocrine system (or otherwise lead to health issues). The following sections address these concerns and outline practical strategies for managing both carbohydrates and fats.

11.1. Carbohydrates

Instead of obsessing over when you eat carbs, or reaching a precise carb intake, I have my clients focus on *which* carbs they are eating, purely from a perspective of hunger management. As chapter 23 will detail, not all carbohydrates are created equally when it comes to keeping you full.

There is a big difference between eating a bowl of boiled potatoes or a huge slice of watermelon versus eating a handful of hyper-palatable sugary snacks. The potatoes and watermelon provide a generous volume of food and water for relatively few calories, stretching your stomach and sending strong fullness signals to your brain. The sugary snacks, engineered to be delicious and addictive, light up your tastebuds but leave you starving an hour later. I do not

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ban sugar, but I strongly advise clients to spend their carbohydrate budget on foods that will help them survive a diet without feeling ravenous.

Some argue that carbohydrate intake should be precisely titrated to match your training volume. It is true that the resistance training literature suggests that higher training volumes deplete more muscle glycogen.[98] However, I consider this largely irrelevant in a fat-loss context because I advise against high-volume training while in a deficit to begin with. During a cut, your goal is muscle preservation, which requires high intensity, not high volume (as chapter 17 will demonstrate). Because your training volume should be low, you do not need to spend your limited macronutrient budget chasing glycogen replenishment. If you decide to ignore my advice and pursue high-volume training while cutting, however, then you will likely benefit from biasing your diet more toward carbohydrates and consuming those carbs around your training window.

11.2. Fats

Once the essential fatty acid requirements are met, we have to treat fat with caution because it is incredibly calorically

[98] MacDougall, J. D., Ward, G. R., & Sutton, J. R. (1977). Muscle glycogen repletion after high-intensity intermittent exercise. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology*, *42*(2), 129–132. https://doi.org/10.1152/jappl.1977.42.2.129

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dense. Fat contains roughly more than twice the calories per gram as carbohydrates or protein. A heavy-handed pour of olive oil over a healthy salad, or a few mindless handfuls of almonds, can easily pack away hundreds of calories and erase a calorie deficit. Fats contribute to feelings of fullness (through the release of the hormones CCK and GLP-1)[99] and are healthy, but they are very easy to overeat if you are not paying attention.

It is a pervasive industry myth that dropping your dietary fat too low will crash your testosterone levels. This fear stems from the fact that steroid hormones are synthesized from cholesterol. However, the panic is largely overblown. While clinical trials do suggest that moving from a high-fat diet to a low-fat diet (defined as dropping dietary fat to below 15 to 20 percent of total calories) decreases serum testosterone, the actual reduction is consistently minor (roughly 13 to 15

[99] Feltrin, K. L., Little, T. J., Meyer, J. H., Horowitz, M., Smout, A. J. P. M., Wishart, J., Pilichiewicz, A. N., Rades, T., Chapman, I. M., & Feinle-Bisset, C. (2004). Effects of intraduodenal fatty acids on appetite, antropyloroduodenal motility, and plasma CCK and GLP-1 in humans vary with their chain length. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, *287*(3), R524–R533. https://doi.org/10.1152/ajpregu.00039.2004

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percent).[100] In practical numbers, this might mean that your testosterone drops from 654 ng/dL down to roughly 569 ng/dL. In the big picture of fat loss and muscle retention, this is irrelevant. These minor fluctuations keep you well within the normal physiological range (roughly 300–1,000 ng/dL for men and 15–70 ng/dL for women) and make very little difference to your physical performance or body composition.

Further, as established in Helms and colleagues' research on natural bodybuilding, if you are dieting to extreme levels of leanness, then a significant drop in testosterone is inevitable regardless of your macronutrient ratio. The prolonged calorie deficit and the depletion of your body fat stores are what truly crash your hormones, rather than your dietary fat intake. Therefore, Helms and colleagues argue that attempting to save your testosterone by hoarding dietary fat at the expense of carbohydrates may be a strategic error, and that natural bodybuilders doing contest prep diets should

[100] Dorgan, J. F., Judd, J. T., Longcope, C., Brown, C., Schatzkin, A., Clevidence, B. A., Campbell, W. S., Nair, P. P., Franz, C., Kahle, L., & Taylor, P. R. (1996). Effects of dietary fat and fiber on plasma and urine androgens and estrogens in men: A controlled feeding study. *The American Journal of Clinical Nutrition*, *64*(6), 850–855. https://doi.org/10.1093/ajcn/64.6.850; Wang, C., Catlin, D. H., Starcevic, B., Heber, D., Ambler, C., Berman, N., Lucas, G., Leung, A., Schramm, K., Lee, P. W., Hull, L., & Swerdloff, R. S. (2005). Low-fat high-fiber diet decreased serum and urine androgens in men. The Journal of Clinical Endocrinology & Metabolism, 90(6), 3550–3559. https://doi.org/10.1210/jc.2004-1530

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keep their fat intake within the range of 15–30% of their total calories. Because your hormonal environment will be compromised regardless, the argument goes, your focus should be on the mechanical stimulus required to retain muscle mass: high-intensity resistance training. Sacrificing your remaining carbohydrate budget just to keep fats high may degrade your peak power output, and that loss of mechanical tension will result in more muscle loss than any marginal dip in testosterone.[101] However, this argument is less relevant for those doing low training volumes. As established earlier, my approach to cutting—even for physique athletes—entails a low volume of training, meaning that you do not need massive amounts of carbohydrates to replenish glycogen.

The actual dangers of a prolonged, extremely low-fat diet fall into two categories: malnutrition via the loss of essential fatty acids and fat-soluble vitamins, and physical pathology such as an increased risk of gallstone formation. With gallstone formation (§9.6) and essential fatty acid deficiencies (§7.6) already discussed, I will concentrate on fat-soluble vitamin absorption here. While your body does require dietary fat to

[101] Helms, E. R., Aragon, A. A., & Fitschen, P. J. (2014). Evidence-based recommendations for natural bodybuilding contest preparation: Nutrition and supplementation. *Journal of the International Society of Sports Nutrition*, *11*(1), 20. https://doi.org/10.1186/1550-2783-11-20

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absorb vitamins A, D, E and K, the fear of malabsorption is largely unfounded for two reasons.

First, fat-soluble vitamins are stored extensively in the liver and adipose tissue.[102] For an average dieter, it takes months of severe deprivation to deplete these reserves, far longer than a typical fat-loss phase. Recall the 1965 case of Angus Barbieri from §7.2. Barbieri consumed zero dietary fat for over a year, yet he did not succumb to fat-soluble vitamin deficiencies. His body simply mobilized the vitamins already stored within his adipose and hepatic stores. He survived safely by supplementing the micronutrients that the body cannot store long-term: essential minerals and water-soluble vitamins.

Second, a diet built on whole foods—which I advocate—is almost never truly zero-fat. Even the leanest proteins and fibrous vegetables contain trace amounts of fat. While you may not want to be on a close-to-zero-fat diet long term, during a dedicated fat-loss phase, combining these whole-food sources with a daily essential fatty acid supplement like fish oil provides your digestive tract with enough total fat to absorb some fat-soluble vitamins. By taking your daily multivitamin alongside your highest-fat

[102] Gropper, S. S., Smith, J. L., & Carr, T. P. (2021). *Advanced nutrition and human metabolism* (8th ed.). Cengage Learning.

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meal, you ensure that absorption remains sufficient for the duration of your diet.

11.3. Key takeaways

- Once total calories, protein and essential nutrients are secured, the precise ratio of carbohydrates to fats is physiologically irrelevant to the amount of fat lost.
- Because the physiological outcome is the same, the choice between higher-carb/lower-fat or lower-carb/higher-fat should be based on personal preference to maximize dietary adherence and minimize misery.
- To manage hunger, spend your limited macronutrient budget on high-volume, low-calorie density carbohydrates (like potatoes and fruit) instead of hyper-palatable sugary snacks; similarly, treat fats with caution due to their high calorie density (9 calories per gram).

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Chapter 12. Does a deficit need to be daily? Continuous vs intermittent caloric restriction

Recognizing that a deficit is required is only the first step. The more complex question is *how* that deficit should be distributed across time. Is it better to impose a restriction every single day? Or is there an advantage to oscillating between periods of severe restriction and periods of relative abundance? To answer this, this chapter will compare the traditional model of Continuous Energy Restriction (CER) and the more dynamic model of Intermittent Caloric Restriction (ICR).

12.1. The standard model: Continuous Energy Restriction (CER)

The standard prescription for weight loss is Continuous Energy Restriction (CER). This is the model that most people intuitively understand as dieting. It is defined by the consistency of the deficit: you consume less energy than you burn every single day, seven days a week.

The primary advantage of CER is its predictability. It allows for the establishment of a stable routine. Meal times, food volumes, food selections and macronutrient distributions can

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be relatively constant from Monday to Sunday. This stability is excellent for habit formation. When you eat the same amount of food at the same times every day, you reduce decision fatigue, i.e., the psychological exhaustion that comes from constantly making choices about food.

However, the always-on nature of CER can be a challenge. The psychological grind of never feeling fully satiated, combined with the absence of any maintenance days to look forward to, can lead to diet fatigue. This is a state of burnout where the dieter eventually gives up because the monotony and continuous pressure became unbearable.

12.2. The non-linear alternative: Intermittent Caloric Restriction (ICR)

In contrast to the flat line of CER, Intermittent Caloric Restriction (ICR) introduces variety into the system. ICR involves a non-linear pattern, oscillating between days of rigorous restriction and days of relative abundance or maintenance. This appeals to a specific psychological profile. In the world of behavioural psychology, there is a distinction between moderators and abstainers.

Moderators do well with CER; they are happy to have a small slice of cake every day. Abstainers, however, find small portions torturous. For them, having a single square of

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chocolate triggers the desire for the whole block. ICR suits the abstainer. It is a trade: periods of acute, rigorous restriction in exchange for periods of normalcy and satiety. For the dieter with a high appetite, the promise of a substantial, full meal tomorrow can make the hunger of today bearable.

12.2.1. The weekly energy review

To visualize how these two different approaches result in the same physiological outcome, we have to look at the week as a whole rather than a single day. The body integrates energy balance over time.

In the example below, we compare two athletes with a maintenance (TDEE) of 2,500 calories. Both aim to lose one pound of fat per week, requiring a net weekly deficit of 3,500 calories.

Day	CER protocol (daily dieting)	ICR protocol (4:3 split)
Monday	2,000 kcal (-500)	2,500 kcal (maintenance)
Tuesday	2,000 kcal (-500)	1,350 kcal (PSMF)

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Wednesday	2,000 kcal (-500)	2,500 kcal (maintenance)
Thursday	2,000 kcal (-500)	1,350 kcal (PSMF)
Friday	2,000 kcal (-500)	2,500 kcal (maintenance)
Saturday	2,000 kcal (-500)	2,500 kcal (maintenance)
Sunday	2,000 kcal (-500)	1,350 kcal (PSMF)
Weekly total intake	**14,000 kcal**	**14,050 kcal**
Net weekly deficit	**3,500 kcal**	**3,450 kcal**
Result	**~1 lb fat loss**	**~1 lb fat loss**

As you can see, despite using completely different daily distributions, both protocols arrive at virtually identical weekly outcomes. The CER protocol achieves its 3,500-calorie weekly deficit through a steady, moderate daily restriction, while the 4:3 ICR protocol relies on three

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aggressive PSMF days (see chapter 14) interspersed with four days of full maintenance.

12.2.2. The lifestyle advantage: banking calories

An advantage of ICR is social flexibility. Family dinners, weddings, Friday night drinks and impromptu work lunches can be tough with a strict 500-calorie deficit. In a CER model, the dieter is sometimes forced to be the odd one out, eating a small salad while others feast, or bringing Tupperware to a banquet.

ICR mitigates this by treating calories as a weekly budget rather than a daily allowance. Restricting aggressively on Tuesday and Thursday effectively lets you bank calories. These saved calories can then be spent on a Saturday night social event without ruining your weekly average. For the general population, this flexibility might be the difference between sticking to healthier eating habits for three months versus three years. It allows you to participate in life without abandoning your physique goals.

12.2.3. ICR for athletes

CER forces you to train in a deficit every single day. ICR allows you to manipulate this. By aligning your schedule, you can place your maintenance days on your training days. This may lead to higher training intensity and therefore a stronger

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anabolic signal, even though you are technically in a long-term diet.

Athletes following the ICR model can modulate the rate of fat loss by adjusting training frequency. If you eat at maintenance on training days and restrict aggressively on rest days, then your weekly deficit is determined by how often you go to the gym. You can essentially use your training schedule as an accelerator (or gas pedal) for your fat loss.

Consider a standard setup where an athlete trains four days a week, perhaps using an upper/lower split (see §19.3). In this scenario, they would enjoy four days of maintenance calories to support those sessions and endure three days of a Protein-Sparing Modified Fast (PSMF; see chapter 14) on their off days. This creates a moderate deficit that balances high-performance training with steady fat loss.

However, if an athlete needs to accelerate their rate of loss, then they can simply drop a training day. By switching to a three-day rotation—such as an alternating upper/lower split—the athlete now has three days of maintenance and four days of PSMF. The removal of that one higher-calorie day and its replacement with a low-calorie day substantially deepens the weekly energy deficit, speeding up fat loss.

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For those seeking an even more rapid reduction in body fat, the protocol can be pushed even further. An athlete might reduce their frequency to just two days a week, using a full-body routine. This results in just two days of maintenance intake and five days of aggressive PSMF restriction.

12.3. Flexible ICR

It is worth noting that a randomized clinical trial by Trepanowski and colleagues demonstrated that alternate-day fasting (a prominent form of ICR), where participants consumed 25% of their energy needs on fast days and 125% on alternating feast days, actually resulted in a higher dropout rate (38%) compared to CER (29%), where participants consumed 75% of their energy needs every day. The data suggest that for the average person, ICR may be more difficult to sustain than CER. Participants often failed to adhere to the low-calorie targets on their fasting days.[103]

Given the potential compliance issues associated with rigidly scheduled ICR, a more sustainable application may be what I

[103] Trepanowski, J. F., Kroeger, C. M., Barnosky, A., Klempel, M. C., Bhutani, S., Hoddy, K. K., Gabel, K., Freels, S., Rigdon, J., Rood, J., Ravussin, E., & Varady, K. A. (2017). Effect of alternate-day fasting on weight loss, weight maintenance, and cardioprotection among metabolically healthy obese adults: A randomized clinical trial. *JAMA Internal Medicine*, *177*(7), 930–938. https://doi.org/10.1001/jamainternmed.2017.0936

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have termed flexible ICR. Rather than adhering to a rigid schedule of predetermined maintenance days, you use an aggressive deficit as your baseline diet and integrate higher-calorie days reactively. These periodic increases do not need to reach full maintenance levels; they can simply represent a smaller, more tolerable deficit, strictly capped at maintenance to avoid entering a calorie surplus. When social obligations or acute diet fatigue arise, you simply deploy one of these elevated-calorie days. This is what I personally do when dieting, the practical execution of which is detailed in §20.1.

12.4. Key takeaways

- Both Continuous Energy Restriction (CER)—a consistent daily deficit—and Intermittent Caloric Restriction (ICR)—oscillating between periods of severe restriction and maintenance—result in the same fat loss outcome, provided that the net weekly calorie deficit is equal.
- The choice between CER and ICR depends on your psychology: CER is better for moderators who thrive on routine and stability, while ICR is better for abstainers who prefer to bank calories for social flexibility and benefit from the suffer-and-feast rhythm.

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- Flexible ICR is my preferred approach to dieting for myself, where you maintain an aggressive baseline deficit and reactively integrate higher-calorie days (strictly capped at maintenance) to accommodate lifestyle disruptions.

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Chapter 13. Building your daily meal plan

In this chapter, we are going to build your daily meal plan from the ground up, using the principles outlined in the previous chapters.

13.1. The Atwater factors

Before proceeding, it helps to understand the basic maths of how macronutrients convert into total caloric energy. The standard conversions are based on a system of measurement known as the Atwater factors.

Developed in the late 19th and early 20th centuries by the chemist Wilbur Olin Atwater, the Atwater factors stipulate that one gram of protein contains 4 kilocalories of energy, one gram of carbohydrates also contains 4 kilocalories of energy, and fat, the most energy-dense of the macronutrients, contains 9 kilocalories per gram, more than double the energy density of proteins or carbohydrates.[104]

[104] While not a macronutrient in the traditional survival sense, it is worth noting that alcohol contains 7 kilocalories per gram, sitting between carbohydrates and fats in terms of density.

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13.2. The three-step process of setting up your diet

With the Atwater factors in mind, we can begin the three-step process of setting up your daily diet: (1) determining the calorie intake; (2) setting protein calories; and (3) setting carbohydrates and fats.

13.2.1. Step 1: determining the calorie intake

The first and most important step is determining the calorie intake. To lose fat, we have to create a calorie deficit by setting your calorie target below your maintenance intake.

Let us introduce a hypothetical subject for this chapter to make the maths tangible. We will call him Arjun. Arjun is a 30-year-old male, standing 178 cm (5′10″) and weighing 90 kg (approximately 198 lbs). He lifts weights three times a week and works a sedentary office job. Through tracking his intake and weight for two weeks, or perhaps by using a TDEE calculator, he has estimated his maintenance calorie intake to be roughly 2,500 calories per day.

To set his intake, Arjun decides on a daily 500-calorie deficit, aiming to lose 0.45 kilograms (1 pound) of fat per week. Subtracting this from his maintenance level, he arrives at a daily target of 2,000 calories. This is his hard ceiling. No matter how the macronutrients are distributed within this

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number, if he consistently eats 2,000 calories, then he will lose weight. However, to maximize fat loss and preserve muscle mass, we need adequate protein.

13.2.2. Step 2: setting protein calories

Once the calorie ceiling is set, the first macronutrient that we place into the budget is protein.

Using our calculations from chapter 10, Arjun will set his protein intake at a robust 200 grams. Now we will convert this protein target into energy to see how much of his 2,000-calorie budget has been spent. Using the Atwater factor for protein, we calculate:

- 200 grams × 4 kcal/g = 800 kcal

Arjun has now allocated 800 of his 2,000 daily calories to protein. This leaves him with 1,200 calories remaining to distribute between fats and carbohydrates. While fats and carbs can fluctuate based on preference, the protein requirement is relatively fixed for the athlete in a deficit.

13.2.3. Step 3: setting carbohydrates and fats

With the protein secured, we will now distribute the rest of the budget. Let us take stock: Arjun started with 2,000 calories and spent 800 calories on his protein requirement.

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- 2,000 - 800 = 1,200 kcal

He has 1,200 calories remaining to distribute between carbohydrates and dietary fats. Unlike protein, which should be relatively fixed during a cut, the ratio of carbs to fats is flexible. If Arjun prefers fruits, rice, potatoes and oats, then he will skew his remaining budget toward carbohydrates. If he prefers steak, avocados, nuts and eggs, then he can skew it toward fats.

For this example, let us set a balanced, middle-ground split. Arjun decides to allocate 500 of his remaining calories to fat and the other 700 calories to carbohydrates.

Using our Atwater conversion factors, we get the following carbohydrate and fat targets:

- Carbohydrates: 700 kcal / 4 kcal/g = 175 grams
- Fat: 500 kcal / 9 kcal/g = 55 grams

While the bulk of this 55-gram fat budget is discretionary—meaning that it can come from olive oil, avocados or peanut butter based on preference—a small portion should be reserved for essential fatty acids. Unless Arjun is consuming fatty fish regularly, he should allocate approximately 3 to 6 grams of this daily fat allowance to a

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high-quality fish oil supplement to ensure an adequate intake of EPA and DHA.

Arjun's daily macronutrient targets are now established:

- Protein: 200 grams (800 kcal)
- Carbohydrates: 175 grams (700 kcal)
- Fat: 55 grams (500 kcal)
- Total: 2,000 kcal

If Arjun wakes up one week and decides that he wants more avocado and less rice, then he simply adjusts the balance of that 1,200-calorie pool. The carbohydrates and fats absorb the fluctuations of one another.

13.3. Implementation

With the numbers set, we will now address how to distribute these macronutrients across the day. We have already complained about the pervasive myth that one should eat six small meals a day to 'stoke the metabolic fire' or that one should consume exactly 30 grams of protein every three hours to prevent muscle wasting. The reality is that the total intake over the course of the 24-hour period is the primary driver of body composition changes. Digestion and absorption are long, rolling processes that can take hours.

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This means that you do not need to divide your macronutrients evenly by the number of meals that you eat. You do not need to eat 33 grams of protein, 9 grams of fat and 29 grams of carbs at 8:00 AM, 11:00 AM, 2:00 PM and so on. Such rigidity can be a recipe for social isolation, obsession and burnout. Instead, the macros can fall wherever they are most convenient for your lifestyle and your hunger patterns. Some people prefer a big dinner to sleep well; others prefer a large breakfast to give them the feeling of powering their workday. As long as the day ends with the totals reasonably close to the targets, the physiological result will be largely the same.

Let us examine what a sample day of eating might look like for Arjun. Remember, his targets are 200 g protein, 175 g carbs and 55 g fat.

Breakfast (8:00 AM)
Arjun wakes up and wants something sweet but substantial. He uses a slightly scaled-down portion of the spiced protein yoghurt bowl from chapter 31 (using 25 g of whey and 250 g of YoPro). To this high-protein base, he stirs in 40 grams of raw oats for slow-digesting carbohydrates and mixes in 15 grams of peanut butter to hit his morning fat targets. It yields a large, thick bowl of food that keeps him full well into the workday.

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Macros approx.: 45 g protein / 35 g carbs / 10 g fat

Lunch (12:30 PM)
Arjun is at the office and brought meal prep. He packed the chicken breast pizza bowl from chapter 31. Because the base meal is almost entirely protein, he uses his macro budget to add 200 grams of diced, boiled potatoes into the bowl. After heating it up, he drizzles 14 g of extra virgin olive oil over the top for healthy fats and stirs it through the pizza sauce.

Macros approx.: 70 g protein / 50 g carbs / 19 g fat

Pre-workout snack (4:00 PM)
It is an hour before the gym, and Arjun wants something fast-digesting. He opts for a scoop of whey protein concentrate, and to provide some simple sugars to fuel his training session, he eats a medium banana alongside it.

Macros approx.: 30 g protein / 30 g carbs / 2 g fat

Dinner (7:30 PM)
This is Arjun's largest meal. He has finished his training and is ravenous. He prepares a slightly scaled-down portion of the lemon pepper white fish and cauli-volume from chapter 31 (using 300 g of white fish instead of 400 g). Because the cauliflower rice provides immense volume with virtually no calories, he adds 150 grams of cooked white rice to the pan,

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letting it absorb the lemon juice and fish stock. Finally, he adds 20 grams of olive oil to the pan while cooking the fish which, together with his fish oil supplementation, rounds out his daily fat allowance. He sits down to a mountain of hot food that signals the end of the day.

Macros approx.: 55 g protein / 60 g carbs / 24 g fat

When we look at this day, the meals were not symmetrical. Yet, by using the PSMF recipes from chapter 31 and simply adding his carbs and fats on top, the cumulative total lands on Arjun's daily targets: 200 g protein, 55 g fat, 175 g carbs.

13.4. Key takeaways

- Diet construction is a three-step process: (1) set your calorie intake; (2) set your protein intake; and (3) the remaining calorie budget is distributed between carbohydrates and fats, which are flexible and should be set based on personal preference to ensure adherence.
- How these macronutrients are distributed across the day is irrelevant, provided that the daily totals are met.

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Chapter 14. Setting up a protein-sparing modified fast

There are specific circumstances—whether due to an approaching deadline, a need to break a stubborn plateau or simply the desire to see rapid results—where the slow road is not an option. Enter the Protein-Sparing Modified Fast (PSMF). The PSMF is the physiological limit of how quickly you can lose fat without cannibalizing muscle tissue or succumbing to malnutrition. I have personally deployed this diet to great effect to strip away body fat with exceptional efficiency, and I have watched many others successfully do the same.

14.1. Defining the PSMF and its history

At its core, a PSMF is precisely what the name suggests: a modified fast that spares protein stores. On a PSMF, you consume adequate protein while keeping carbohydrates and fats as close to zero as possible.

In a total fast, where one consumes nothing but water, the body rapidly transitions to burning stored body fat for fuel. While the body possesses remarkable protein-sparing adaptations during a total fast, it cannot stop muscle

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catabolism entirely.[105] In the absence of dietary protein, the body has to harvest essential amino acids from skeletal muscle.[106] While the magnitude of this muscle loss is often overstated in fitness circles, an eventual slow, continuous loss of actual muscle tissue is physiologically unavoidable in a total fast.

The PSMF solves this biological dilemma. By providing just enough dietary protein to cover this obligatory amino acid turnover, it prevents muscle catabolism while restricting total energy so severely that the body is forced to meet its daily energy requirements almost entirely by oxidizing stored adipose tissue.

As detailed in chapter 7, the early execution of this logic—manifested in the Last Chance Diet—was tragic. However, the failure of those early protocols was not due to the rapidity of the fat loss, but rather the inadequate nutritional composition and poor-quality protein. The lesson learned from the Last Chance Diet is that protein quality and electrolyte balance are an absolute necessity.

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[105] Chief among these adaptations is the production of ketone bodies, which displace the brain's glucose demand and suppress protein breakdown. For an explanation of this mechanism, see Manninen, A. H. (2006). Very-low-carbohydrate diets and preservation of muscle mass. *Nutrition & Metabolism*, *3*. https://doi.org/10.1186/1743-7075-3-9

[106] Church, D. D., Gwin, J. A., Wolfe, R. R., Pasiakos, S. M., & Ferrando, A. A. (2019). Mitigation of Muscle Loss in Stressed Physiology: Military Relevance. *Nutrients*, *11*(8), 1703. https://doi.org/10.3390/nu11081703

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Modern PSMF protocols have corrected these fatal errors. Today, a properly set-up PSMF relies on high-quality, whole-food protein sources that provide a complete amino acid profile, alongside rigorous supplementation to maintain electrolyte balance.[107] When executed with these safeguards, clinical literature supports the PSMF as a safe and highly effective tool for rapid weight reduction, often resulting in weight losses of one to three kilograms per week, depending on your starting point.[108]

14.2. Setting your protein target

Since protein is the sole macronutrient consumed in meaningful quantities on a PSMF, what daily target should you be aiming for?

Certainly, I would not advise going any lower in protein intake than what is seen in the medical literature. In clinical settings—where the PSMF is typically administered to obese patients—an intake between 1.2 and 1.5 grams of protein per

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[107] Palgi, A., Read, J. L., Greenberg, I., Hoefer, M. A., Bistrian, B. R., & Blackburn, G. L. (1985). Multidisciplinary treatment of obesity with a protein-sparing modified fast: results in 668 outpatients. *American Journal of Public Health*, *75*(10), 1190–1194. https://doi.org/10.2105/AJPH.75.10.1190

[108] Chang, J., Kashyap, S. R. (2014). The protein-sparing modified fast for obese patients with type 2 diabetes. *Cleveland Clinic Journal of Medicine*, *81*(9), 557–565. https://doi.org/10.3949/ccjm.81a.13128

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kilogram of ideal body weight is prescribed.[109] For a 178 cm (5′10″), 110-kilogram person aiming for a 73-kilogram 'ideal' body weight, this would represent 88 to 110 grams of protein per day. While acceptable for an obese dieter, a higher protein intake is advisable for an already-lean, resistance-training athlete.

To set your protein intake, you can refer to the guidelines in chapter 10. When personally executing a PSMF as a lean, resistance-training dieter, I set a minimum of 2.5 grams of protein per kilogram of lean body mass and permit flexibility above that threshold.

It is important to remember that protein still contains calories. While it is difficult to overeat, consuming unlimited protein can theoretically push you out of a deficit or even into a calorie surplus, halting your fat loss. To prevent this, I recommend capping your intake at an absolute maximum of 4 g/kg LBM.

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[109] Chang, J., Kashyap, S. R. (2014). The protein-sparing modified fast for obese patients with type 2 diabetes. *Cleveland Clinic Journal of Medicine*, *81*(9), 557–565. https://doi.org/10.3949/ccjm.81a.13128; Palgi, A., Read, J. L., Greenberg, I., Hoefer, M. A., Bistrian, B. R., & Blackburn, G. L. (1985). Multidisciplinary treatment of obesity with a protein-sparing modified fast: results in 668 outpatients. *American Journal of Public Health*, *75*(10), 1190–1194. https://doi.org/10.2105/AJPH.75.10.1190

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14.3. Managing incidental macronutrients

With the protein target set, the management of carbohydrates and fats is simple: they are to be kept as low as humanly possible. There is no percentage target here; there is only incidental. You do not use fats for flavour—meaning no buttered vegetables or oily salad dressings—and you strictly avoid consuming starchy sides. The only exception to the low-fat rule is the supplementation of Essential Fatty Acids (EFAs). Because the body cannot manufacture omega-3 fatty acids, and you are consuming no dietary fat, you should supplement with high-quality fish or algae oil (I recommend 2–4 g EPA/DHA combined each day). Aside from this, your fat and carbohydrate intake should come solely from the trace amounts found in your lean protein sources and fibrous vegetables.

One exception to the carbohydrate rule is the intra-workout window. If you find that your strength is cratering during your weight-training sessions, then you may consume roughly 15 grams of fast-digesting carbohydrates immediately before or during your workout. You are looking for pure glucose or sucrose sources that require minimal digestion, such as a handful of gummy bears, a small box of raisins or a dedicated carbohydrate powder (e.g., Gatorade powder, dextrose or highly branched cyclic dextrin). This small bolus

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of glucose provides enough of a blood sugar spike to power your high-intensity sets without adding many calories.

14.4. Hydration and electrolytes

As detailed in §7.5, the drop in insulin from carbohydrate restriction triggers a rapid flush of water and vital minerals. While this initial shedding of water weight looks fantastic on the scale, failing to replenish what is lost is a guaranteed ticket to the dreaded keto flu. To sidestep this, you will need to salt your food generously with a Lite salt containing both sodium and potassium, take a nightly magnesium supplement and potentially even take a daily calcium supplement, depending on whether you are eating dairy. Make no mistake: neglecting these essential minerals is the fastest way to tank your energy levels and bring your diet to a premature end.

14.5. Calculating the deficit

Calculating the calorie deficit on a PSMF is unique because you do not target a specific calorie number; rather, the calorie count is the result of your protein and vegetable intake. You aim for your protein target, add your fish oil and vegetables and let the calories land where they may. For a 90-kilogram man, a daily target of 176 grams of protein yields 704 calories. When you add 6 grams of fish oil (54 calories), a

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large volume of vegetables (perhaps 150 calories) and the incidental carbohydrates and fats accompanying your lean protein sources (perhaps 100 calories), the total daily intake is roughly 1,000 calories. Given that a 90-kilogram man likely burns 2,500 to 3,000 calories a day, the resulting deficit is tremendous, often exceeding 1,500 to 2,000 calories per day. This is what causes the rapid fat loss. Because one kilogram of human adipose tissue contains approximately 7,700 calories, a daily deficit of 1,500 to 2,000 calories translates mathematically to burning through 1.3 to 1.8 kilograms of pure fat every week.

14.6. Food selection

The concept of If It Fits Your Macros (IIFYM) is strongly discouraged during a PSMF. In a moderate deficit, you can get away with allocating a portion of your calories to junk food. On a PSMF, this is a mistake. Highly palatable, calorie-dense foods trigger hunger signals and cravings that are unmanageable in such a deep deficit. The diet relies on the blunting of hunger that occurs with ketosis[110] and a high

[110] Gibson, A. A., Seimon, R. V., Lee, C. M. Y., Ayre, J., Franklin, J., Markovic, T. P., Caterson, I. D., & Sainsbury, A. (2015). Do ketogenic diets really suppress appetite? A systematic review and meta-analysis. *Obesity Reviews*, *16*(1), 64–76. https://doi.org/10.1111/obr.12230; Sumithran, P., Prendergast, L. A., Delbridge, E., Purcell, K., Shulkes, A., Kriketos, A., & Proietto, J. (2013). Ketosis and appetite-mediating nutrients and hormones after weight loss. *European Journal of Clinical Nutrition*, *67*(7), 759–764. https://doi.org/10.1038/ejcn.2013.90

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protein intake; introducing sugar spikes insulin and reactivates the hunger cues that you are trying to suppress.

This strictness limits your food selection. In terms of protein sources, we are looking for the highest protein-to-calorie ratio possible. Chicken breast, turkey breast, seitan, egg whites, white fish (like cod, hoki, snapper, flake, tilapia or halibut) and very lean red meat (96% lean or higher) are the staples. A common pitfall is the over-reliance on protein powder. While whey protein is technically permissible, liquids do not trigger the same satiety signals as solid food. Chewing a chicken breast takes effort and time; drinking a shake takes seconds. Therefore, solid meals are superior to liquid nutrition on a PSMF.

This brings us to the vegetables. While this diet is carnivorous in its protein focus, it benefits from a herbivorous volume of plant matter. You can consume large amounts of fibrous vegetables—say, two big handfuls per meal—such as spinach, broccoli, cauliflower, asparagus and Brussels sprouts. These vegetables provide bulk to keep the digestive system moving. Perhaps more importantly, they provide a physical sensation of fullness. When you are in a calorie deficit, activating your stomach's stretch receptors is a great defence against hunger. Half a kilogram of broccoli contains rather few calories but occupies a lot of space in the

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stomach.[111] However, one must be discerning; vegetables such as potatoes, corn, carrots and peas are off-limits due to their carbohydrate content.

To make this restrictive palette palatable, it helps to become a master of the spice rack. Spices, herbs, hot sauces, mustard, vinegar and soy sauce are generally free foods (checking labels for sugar and fat content) that can save you from flavour fatigue.

Put simply, the basic formula for any PSMF meal is this:

- Ingredients: lean protein + vegetables.
- Instructions: combine and eat.

For a comprehensive, aisle-by-aisle list of approved PSMF foods, refer to the grocery guide in chapter 30. For instructions on how to combine these ingredients and cook without added carbs and fats, see the recipes in chapter 31.

[111] Still, much like protein, fibrous vegetables contain energy. While you would have to eat a monumental amount of cauliflower to halt your fat loss, you cannot consume an unlimited amount of it without consequence.

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14.7. Essential kitchen tools and cooking methods

Unless you plan to survive entirely on canned tuna and chicken, a PSMF requires cooking.

Because a PSMF is so strict, the key to your success will be removing all barriers to execution. When hunger sets in, the temptation to stray from the plan can be large. Your best defence against impulse eating is to ensure that making the right choice is easier than cheating. It makes sense either (a) to prepare your meals in advance so that they are waiting in the refrigerator; or (b) to streamline your meal assembly process so that it is practically effortless, e.g., by having your raw proteins pre-weighed and your vegetables pre-chopped.

The most valuable piece of equipment on a PSMF is a digital kitchen scale. You will lose a substantial amount of fat on this diet even if your calorie tracking is slightly imprecise, but a kitchen scale will help you reach your precise protein goal to ensure muscle preservation. You should weigh all of your proteins in their raw state as well as any trace-calorie condiments. For a comprehensive explanation of why and how to track your calories and macronutrients, see chapter 21.

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Once your food is measured, finding a way to cook it without adding fats becomes your primary logistical hurdle. High-quality non-stick cookware is excellent to have. Ceramic or well-maintained non-stick pans paired with a light mist of cooking spray will allow you to sear meats and egg whites without them binding to the pan.

Air fryers and slanted indoor electric grills (such as a George Foreman grill) are useful because they cook your meats while simultaneously rendering and draining off any naturally occurring residual fats.

For inherently fat-free cooking, options include the oven, air fryer, steamers and the microwave. Baking or convection roasting works perfectly for white fish and lean pork. For speed and convenience, a simple silicone vegetable steamer basket that can be microwaved is a valuable tool. Do not overlook the microwave for proteins, either. While it may lack culinary prestige, the microwave is a highly effective, entirely fat-free method for steaming white fish fillets or cooking liquid egg whites in a matter of minutes. Alternatively, you can replicate the effect of pan-frying without the calories by broth sautéing. Simply cook your vegetables or diced chicken in shallow amounts of clear chicken, beef or vegetable broth instead of oil.

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Finally, if you find yourself dining out or in a situation where foods absolutely must be prepared with trace amounts of cooking fat, then you can employ the blotting method. Use a clean paper towel to blot the surface of the cooked meat aggressively before eating it. You will be surprised by how much residual oil and grease can be manually removed from the surface of the food, saving you from ingesting unnecessary tagalong calories that would otherwise eat into your deficit.

14.8. Maintenance days and diet breaks

For those who are running the diet for an extended period, the psychological and physiological grind can become overwhelming. To mitigate this, we integrate either (a) maintenance days; or (b) full diet breaks.

Starting with maintenance days, it is imperative to distinguish this from a cheat day. A cheat day implies a loss of control; a maintenance day is a deliberate and controlled intervention. This is a single day where you bring your calories back up to your maintenance level (the amount of energy you burn in a day). The goal here is to stop the deficit. During a maintenance day, you keep your protein high, but you substantially increase your carbohydrate and/or fat intake.[112]

[112] It is generally preferable to allocate those extra calories to carbohydrates rather than fats for reasons explained in §28.4.

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Carbohydrate sources should be starchy and relatively ‘clean’: fruit, oats, rice, pasta and potatoes. This influx of carbohydrates refills glycogen stores in the muscles, which aids in training performance, but more importantly, it provides a psychological reprieve. It reminds you that rigid dieting is not a life sentence.

You can deploy maintenance days proactively—scheduling them in advance to align with social events (as described in chapter 12)—or reactively, using them as an emergency brake whenever you feel your adherence slipping. However, it is important to note that an outing with friends or a social obligation does not automatically mandate a full maintenance day. If you have to eat a bit extra for whatever reason, then your approach can simply be to stay as close to the PSMF parameters as possible given the social constraints. Another approach is to eat strict PSMF meals during the day so that you can save calories for the evening. Just be careful not to treat this as a license to gorge yourself at dinner. If you make smart choices, then you may very well still end the day in a calorie deficit.

While a maintenance day provides immediate relief, a prolonged PSMF eventually necessitates a full diet break. The complete guidelines for their implementation are covered in depth in chapter 28.

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14.9. Training guidelines

On a PSMF, your recovery capacity is severely compromised because you lack the energy intake to repair tissue. Therefore, weight training should be minimal and high-intensity. Intensity here refers to the weight on the bar and your proximity to muscular failure, not your heart rate. You should strive to maintain the weight you were lifting before the diet for the same reps. If you leg pressed 100 kilograms for 5 reps, then you should try to continue leg pressing 100 kilograms for 5 reps. However, the volume should be radically slashed. Your routine should be reduced to either a full-body workout performed just two times per week or once every fourth or fifth day, or a rotating upper/lower split performed three times per week (see chapter 19). You are doing just enough training to maintain muscle mass, while ensuring that you do not generate more fatigue than your body can repair.

Finally, we must address cardio. The instinct may be to crank up the intensity through running and spinning or to punish yourself with sprints to maximize the deficit. On a PSMF, High-Intensity Interval Training (HIIT) and moderate-intensity jogging are effectively banned. These activities place a big recovery demand on the body, spiking cortisol. High cortisol combined with severe caloric restriction creates a catabolic environment where the body's

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ability to protect existing muscle tissue is reduced. Further, the calorie burn from a 5-kilometre run is negligible compared to the 2,000-calorie deficit you are already creating through diet. Coupled with the fact that excessive cardio compromises your recovery for resistance training and invites injury, the risk-to-reward ratio is high. The only permissible cardio is Low-Intensity Steady-State (LISS) activity, preferably walking. Walking burns fat without spiking cortisol or impairing your recovery.

14.10. Managing hunger

When setting up a PSMF, managing hunger should be a primary consideration. Hunger will occur; it is a biological inevitability when you starve the body. However, the combination of high protein, high volumes of vegetables and ketosis generally blunts the sharpest edges of appetite after the first few days. Routine is your ally; eating at the same times every day conditions the hunger hormone ghrelin to spike only at those specific windows.[113] Stimulants, such as caffeine, can be used as effective appetite suppressants, provided that they do not interfere with sleep.[114] For a

[113] Frecka, J. M., & Mattes, R. D. (2008). Possible entrainment of ghrelin to habitual meal patterns in humans. *American Journal of Physiology-Gastrointestinal and Liver Physiology*, *294*(1), G224–G232. https://doi.org/10.1152/ajpgi.00448.2007

[114] Schubert, M. M., Irwin, C., Seawright, R. F., Oliver, S. R., Grant, G., & Desbrow, B. (2017). Caffeine, coffee, and appetite control: a review.

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complete breakdown of these tactics and further strategies to mitigate hunger, see chapter 22.

14.11. Who the PSMF is not for

The PSMF, though effective, is not for everyone. It can be unsustainable for various lifestyle, financial or psychological reasons.

For instance, if you are forced into situations where you have to share normal dinners with your family and eating a separate meal every night causes marital or familial strife, then the PSMF may not be worth the cost. Similarly, if you are on a tight budget, then affording enough vegetables and high-quality, ultra-lean meat and fish to sustain a PSMF may not be financially viable. Vegans will also find a true PSMF challenging, as relying exclusively on plant-based protein sources makes it hard to avoid incidental carbohydrates and fats. To do a true PSMF, vegans will have to rely predominantly on protein powders, which can make adherence a struggle. Vegans will also struggle to obtain certain micronutrients (e.g., vitamin B12, iron, zinc, calcium and iodine) on a true PSMF due to the absence of animal proteins and the inability to consume high-volume plant sources without exceeding macronutrient limits,

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International Journal of Food Sciences and Nutrition, *68*(8), 901–912. https://doi.org/10.1080/09637486.2017.1320537

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necessitating supplementation.[115] Finally, there are those who give the PSMF an honest, wholehearted effort but simply cannot handle a diet so restrictive.

If you fall into any of these categories, then do not despair. Depending on your situation, you may still be able to diet aggressively with a more relaxed version of the PSMF. Start by securing your protein, essential nutrient and vegetable intake, and then add a small amount of carbohydrates and/or fats on top of that base—perhaps 50 to 100 calories per meal from dairy or fruit—to create a more manageable, palatable diet. This will not impact the deficit greatly but may make adherence easier. And even if this more relaxed version of the PSMF is untenable, know that as long as the three fundamental pillars are in place—a calorie deficit, sufficient protein intake and resistance training—fat loss will occur, whether or not you use a PSMF.

14.12. Key takeaways

- The PSMF is the physiological limit for rapid fat loss, defined as a modified fast that provides sufficient high-quality protein to spare muscle tissue while severely restricting carbohydrates and fats.

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[115] Murphy, S. P., & Allen, L. H. (2003). Nutritional importance of animal source foods. *The Journal of Nutrition*, *133*(11), 3932S–3935S. https://doi.org/10.1093/jn/133.11.3932s

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- The modern PSMF is safe and highly effective.
- Prioritize whole foods that offer the highest possible protein-to-calorie ratio, keeping your reliance on liquids and protein powders to a minimum.
- The extreme calorie deficit (often 1,500–2,000+ kcal/day) causes the rapid fat loss and is the result of consuming only protein and fibrous vegetables.
- Essential Fatty Acids (EFAs) and electrolytes should be supplemented daily.
- Weight training volume should be radically slashed while maintaining intensity (weight on the bar and proximity to failure) to provide the muscle-sparing stimulus without compromising limited recovery capacity; Low-Intensity Steady-State (LISS) walking is the only permissible cardio.
- Integrate strategic maintenance days or full diet breaks periodically to prevent burnout.

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Chapter 15. Cardio and fat loss

When most people decide that they want to lose body fat, their first instinct is to hit the pavement or hop on the treadmill. They view exercise as a simple, calorie-burning transaction: running burns more calories per hour than lifting weights, therefore running is the superior tool for fat loss.

While cardio burns calories and is exceptionally valuable for improving health, it is inferior to resistance training for fat loss. To use cardio effectively, we have to broaden our understanding of what it does, and just as importantly, compare it to the effects of resistance training.

15.1. Defining cardio

Cardiovascular training (cardio), or aerobic training, is characterized by rhythmic, repetitive activity where the intensity is low enough to be sustained for longer durations. This includes running, cycling, rowing or swimming. The limiting factor is the heart and lungs reaching their limit in supplying oxygen and fuel to the working tissues. The primary adaptation here is systemic efficiency: a stronger heart, better blood flow, increased red blood cell count and more efficient mitochondria.

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While there is a grey area—such as high-repetition circuit training or CrossFit, which tax both the cardiovascular system and the musculoskeletal system—for the purpose of contemplating fat loss optimization, it helps to view cardio and resistance training as separate phenomena.

15.2. Why resistance training is better than cardio for fat loss

If you were to forgo all exercise and simply starve yourself, then you would lose weight. But without a mechanical signal to the contrary, your body will catabolize muscle tissue alongside fat to meet its energy demands. In a famine—which is how your body perceives a diet—unused muscle is a liability.

Resistance training provides the necessary justification for retaining that expensive tissue. When you lift heavy loads with a sufficient proximity to failure, you generate mechanical tension. This tension sends a molecular signal, primarily via the mTOR pathway, that effectively tells the body: 'we need this tissue to survive the current environmental stressors'.

Keep in mind that this protection is specific only to the muscles being stimulated. This explains the difference in physique between a sprinter and a marathon runner. The

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sprinter exerts explosive force against the ground, recruiting high-threshold fast-twitch muscle fibres (type II) in the legs. This high-intensity stimulus protects the leg musculature from atrophy. The marathon runner, conversely, relies on low-intensity, repetitive contractions that prioritize systemic efficiency over force production; there is less mechanical reason for the body to retain muscle tissue.

While high-intensity cardio can protect the legs, resistance training is the superior tool because it allows you to apply that protective sprinter's stimulus to the entire body. Sprinting might save your quads, but it does nothing for your neck, deltoids, upper arms, chest or lats. Lifting weights lets you systematically send a survival signal to every muscle group, which will ensure that you retain the silhouette of a sculptor's statue rather than just a pair of athletic legs.

Finally, and perhaps most importantly in a deficit, is the issue of systemic fatigue. High-intensity conditioning generates considerable systemic fatigue. A session of maximum-effort sprints taxes the central nervous system and the joints to a degree that often interferes with weight training. In a calorie deficit, your recovery resources are often already severely compromised. Resistance training, conversely, allows you to take a specific muscle to failure with precision, stimulating the local tissue without incurring the total-body devastation

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of a track workout.[116] You can take your quads to failure on a leg extension machine without wiping yourself out; the same cannot be said for a 400-metre sprint.

Therefore, if you choose cardio alone, then you risk losing weight indiscriminately; shedding fat, but also muscle. If you choose resistance training, then you preserve your existing muscle mass. If you can only pick one, then you pick the iron.

15.3. The broader case for cardio

While resistance training is optimal for muscle preservation, cardiovascular exercise is still vastly superior to being sedentary. If you were to place two people in a calorie deficit—one who runs daily and one who is entirely inactive—then the runner would retain more lean mass.[117] Muscle tissue adheres to the 'use it or lose it' principle. While the mechanical tension generated by aerobic activity

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[116] It is worth noting that for a complete beginner, almost any novel stimulus will generate significant systemic fatigue and severe Delayed Onset Muscle Soreness (DOMS). This occurs because the body has not yet developed the *repeated bout effect*, i.e., a neurological and cellular adaptation that protects muscle tissue against damage from familiar movements. Further, beginners are neurologically inefficient, meaning that the central nervous system works in overdrive simply to coordinate the exercise.

[117] Garrow, J. S., & Summerbell, C. D. (1995). Meta-analysis: effect of exercise, with or without dieting, on the body composition of overweight subjects. *European Journal of Clinical Nutrition*, *49*(1), 1–10.

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is significantly weaker than the signal sent by resistance training, it is still a signal. It tells the body that the muscles are currently necessary for survival, offering protection against atrophy that the sedentary dieter lacks.

Cardio is a good supplementary strategy, which is described below, but it is not a physiological requirement for fat loss. It is entirely possible to reach stage-ready levels of leanness—single-digit body fat—relying solely on calorie restriction and resistance training. When it comes to fat loss, cardio is best thought of as a tool to increase energy expenditure; it does not trigger any unique metabolic processes required to burn fat.

15.4. Combining cardio and resistance training safely

Concurrent training—the combination of resistance training and cardiovascular work—is highly effective for fat loss, provided that it is programmed correctly. At its best, it lets you increase your calorie expenditure while preserving muscle. At its worst, it can lead to injury and compromise your lifting.

While your heart might be able to handle the extra workload of concurrent training, your joints and connective tissue may not. High-volume, high-impact cardio—such as

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long-distance running—creates systemic fatigue and joint stress. If you enter the weight room with pre-exhausted stabilizers and aching knees, then you are inviting disaster.

To manage this, the modality matters. Low-impact cardio like cycling, walking, rowing or using an elliptical causes less eccentric muscle damage and joint impact than running or jumping rope,[118] which saves your structural integrity for the heavy lifting. Ideally, you should also separate strenuous cardio and lifting by at least six hours to allow for physical recovery.[119] If you must do them in the same session, then always lift first while you are fresh and do cardio after.

15.5. Basic cardio guidelines

For those who want to include cardio—quite understandably, for the extra calorie burn and its immense benefits to heart health and longevity—the question is how much intensity your body can tolerate while dieting. Counter-intuitively, the steeper your calorie deficit, the lower your Rating of Perceived Exertion (RPE) should be outside the weight room.

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[118] Whitfield, M., & Tomlinson, O. W. (2025). Optimal exercise modalities and doses for therapeutic management of osteoarthritis of the knee. *Frontiers in Aging*, *6*. https://doi.org/10.3389/fragi.2025.1458983

[119] Robineau, J., Babault, N., Piscione, J., Lacome, M., & Bigard, A. X. (2016). Specific training effects of concurrent aerobic and strength exercises depend on recovery duration. *Journal of Strength and Conditioning Research*, *30*(3), 672–683. https://doi.org/10.1519/jsc.0000000000000798

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While this seems backward—common sense suggests that if you are dieting hard, then you should add more intensity to burn more fat—physiological reality suggests the opposite. You need to view your recovery capabilities as a bank account. Every stressor, whether it is a calorie deficit, resistance training or cardio, is a withdrawal from that account, while sleep and food are the only deposits. When you are in a steep deficit, your income is meagre. You barely have enough recovery resources to repair the damage from your resistance training. If you pile high-intensity cardio on top of a starvation diet and heavy lifting, then you will bankrupt your recovery. Excessive intensity effectively digs a recovery hole that you cannot fill, resulting in chronically elevated cortisol, water retention, strength loss, injury and, eventually, muscle catabolism.

To manage these withdrawals effectively, we can use the Rating of Perceived Exertion (RPE) scale. This is a subjective assessment of effort graded from 1 to 10, best calibrated using the talk test. A RPE of 1 to 2 is effortless movement where you can hold a full conversation without pausing; this is a casual stroll. A RPE of 3 to 4 is the aerobic zone, where you are breathing heavier but can still speak in full, complex sentences. Once you hit RPE 5 and above, breathing becomes laboured, speech breaks down into short phrases and the systemic fatigue cost skyrockets. Your cardio

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protocol should be inversely correlated with the severity of your deficit using these zones.

15.5.1. Cardio guidelines for the small deficit

When the deficit is small—targeting roughly 0.5% body weight loss per week—you are operating with a safety net. Here, you have recovery reserves to hand. Consequently, you can handle moderate to high volumes of cardio, perhaps three to five formal 20- to 60-minute sessions a week. This is also the only context where you can touch the upper limits of the intensity scale. You can get away with one weekly session of HIIT (RPE 8–9), provided that it does not interfere with your leg training. Standard steady-state work in the RPE 5 to 6 range—where breathing is elevated but manageable—is also perfectly fine here.

15.5.2. Cardio guidelines for the moderate deficit

Things change when you step up to a moderate deficit, aiming for about 1.0% loss per week. Here, you will start to feel the pinch. Fatigue accumulation becomes a tangible factor and your joints will not recover as quickly as they did at maintenance. You must become economical. At this stage, intensity should be capped strictly at an RPE of 3 or 4. Eliminate HIIT entirely; generating RPE 8+ fatigue is too much central stress relative to its calorie burn. Instead, you can aim for three to four 20- to 60-minute sessions of

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Low-Intensity Steady State (LISS) cardio or simply maintain a high daily step count. You should be able to hold a conversation in full sentences without gasping. Prioritize low-impact modalities like incline walking or the elliptical to spare your joints for the heavy lifting.

15.5.3. Cardio guidelines for the large deficit

Finally, we arrive at the large deficit: losing 1.5% of body weight or more per week. This is crash-diet or PSMF territory where you are effectively running on fumes. In this state, you should throttle back cardio aggressively to zero or minimal formal sessions. Your exertion should be capped at an RPE of 2. If you are sweating heavily or cannot breathe exclusively through your nose, then you are working too hard. You should stick to walking or cycling Dutch-city-style only. You should rely almost exclusively on dietary restriction to drive fat loss because your limited energy should be hoarded entirely for the only high-RPE stimulus that matters: maintaining strength in the gym. In a steep deficit, the gym is for muscle preservation, not calorie burning.

15.6. How many steps should I take?

Of all the questions that I receive regarding cardiovascular activity, one stands out with such frequency that it requires its own dedicated section: ‘how many steps should I take?’

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While the fitness industry often parrots the arbitrary benchmark of 10,000 steps—a number that actually originated from a 1960s Japanese marketing campaign for a pedometer—the scientific literature suggests a more modest requirement for health. Research indicates that the metabolic and health benefits of daily movement begin to compound steeply around the 7,000 to 8,000 step mark.[120] Therefore, I consider 7,000 steps to be the evidence-based minimum. Falling consistently below this threshold not only deprives you of these health benefits, but it also makes it difficult to create a meaningful calorie deficit without severely restricting your food intake.

Your daily step count should ideally not go down over the course of a diet. In fact, as your metabolism subtly adapts to your lower body weight, you may even need to increase your steps slightly just to maintain the same rate of fat loss. It makes sense to set a minimum to your daily movement, whether that is 8,000, 10,000 or 12,000 steps. This is so that you can intellectually override any unconscious attempt by

[120] Ding, D., Nguyen, B., Nau, T., Luo, M., del Pozo Cruz, B., Dempsey, P. C., Munn, Z., Jefferis, B. J., Sherrington, C., Calleja, E. A., Chong, K. H., Davis, R., Francois, M. E., Tiedemann, A., Biddle, S. J. H., Okely, A., Bauman, A., Ekelund, U., Lee, I.-M., ... Owen, K. (2025). Daily steps and health outcomes in adults: A systematic review and dose-response meta-analysis. *The Lancet Public Health*, *10*(8), e668–e681. https://doi.org/10.1016/S2468-2667(25)00164-1

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your body to conserve energy, which will ensure that the deficit you have created in the kitchen stays intact.

As a general heuristic, an average person burns roughly 300–400 calories for every 10,000 steps taken, though this fluctuates based on total body weight and pace.[121] This is a substantial contribution to your daily energy budget, allowing you either (a) to eat a little more food; or (b) to lose a little more fat. If you have the time, the lifestyle and the desire to burn more calories, then there is nothing wrong with scaling your activity up to 20,000 or even 30,000 steps per day, provided that you do so gradually. Rushing into a higher volume of steps can lead to blisters and shin splints, so it is a good idea to give your feet and joints time to adapt.

Additionally, if you raise your step count while dieting, then be mindful of the transition when the diet ends. If you intend to drop your steps back down to your pre-diet volume, then your daily energy expenditure will drop with them. You should adjust your maintenance calories downward to account for this missing activity, otherwise you will accidentally place yourself in a calorie surplus.

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[121] Choi, B. C. K., Pak, A. W. P., & Choi, J. C. L. (2007). Daily step goal of 10,000 steps: A literature review. *Clinical & Investigative Medicine*, *30*(3), 146. https://doi.org/10.25011/cim.v30i3.1083

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For those pressed for time or looking to maximize the efficiency of their walking, walking with a weighted vest is an effective strategy. As you lose body fat, you naturally burn fewer calories during activity simply because you are moving a lighter mass. Strapping a 5- to 15-kilogram vest to your torso artificially restores that lost weight, increasing the mechanical demand and energy expenditure of every step without requiring you to walk for longer. It is an excellent way to 'trick' your body into working harder and increasing your deficit.

The overarching advantage of walking—whether unweighted or with a vest—is that this calorie burn is achieved without generating the systemic fatigue associated with more intense forms of cardio. This low-fatigue nature is why walking is the ultimate companion to heavy resistance training. If your primary goal is to retain muscle tissue while losing fat, then your weight training sessions must remain intense. Walking requires little recovery, it does not compete with your squats or deadlifts for biological resources and it can even aid in your recovery between sessions by promoting gentle, oxygen-rich blood flow to working muscles. It is the perfect, low-impact tool to increase your calorie deficit without compromising your performance on the gym floor.

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15.7. Key takeaways

- For fat loss, resistance training takes precedence over cardio due to its unmatched capacity to preserve muscle tissue.
- Cardio is not a physiological requirement for fat loss but can be used as a supplementary strategy to increase TDEE and is valuable for overall health and longevity.
- When combining training, always lift first while fresh, and use low-impact modalities (walking, cycling, elliptical, rowing) to save your joints and recovery resources for heavy lifting.
- The intensity of cardio should be inversely correlated with the severity of your calorie deficit: the more aggressive the cut, the lower the exertion should be.
- Maintaining a high daily step count (with 7,000 steps as the evidence-based minimum) is an effective low-fatigue tool to increase your energy deficit without compromising muscle recovery or strength.

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Chapter 16. Essential lifting terms and concepts

This chapter clarifies the essential terms of resistance training used throughout the rest of this guide.

16.1. Reps

A repetition, or ‘rep’ represents one complete cycle of a specific exercise. It is the journey of a resistance—whether a barbell, a cable, a resistance band or your own body weight—from a starting point, through an intended range of motion and back again. A well-executed repetition involves two phases, separated by brief transitions: the concentric phase, where the target muscle shortens to overcome the resistance, and the eccentric phase, where the muscle lengthens to control the load on its return.

A well-performed repetition requires a consistent tempo and a standardized range of motion. When ego lifting takes over and form breaks down—often through the use of momentum or a shortened stroke—the repetition may lose its effectiveness for targeted muscle stimulation.

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16.2. Sets

A set is a discrete group of repetitions performed consecutively without a significant break. Once the intended number of reps is finished and the lifter racks the weight or pauses to recover, the set is considered complete. These bouts of effort are separated by rest intervals, which allow the body to replenish the energy stores necessary to perform the next round of work.

16.3. Compound and isolation lifts

Resistance training exercises broadly fall into two categories: compound lifts and isolation lifts.

Compound lifts (or multi-joint movements) involve movement at two or more joints and recruit multiple muscle groups simultaneously. Classic examples include squats, bench presses, deadlifts and pull-ups.

Isolation lifts (or single-joint movements) involve movement at only one joint, directing the mechanical tension to a specific target muscle. Examples include biceps curls, leg extensions and lateral raises.

The chief advantage of compound lifts is their time efficiency. Because they stimulate a vast amount of muscle

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mass simultaneously, a workout built around them yields a great return on investment for your time in the gym. However, there is no unique physiological magic to a compound movement. If you had unlimited time and the desire to do so, then you could theoretically build a complete physique using exclusively isolation lifts, painstakingly targeting every individual muscle group one by one.

When performing compound lifts, the primary muscle typically gives out first, meaning that the assisting muscles rarely reach failure. For example, when you perform a chest press, your pectoral muscles will likely reach failure before your triceps do. However, although the set terminates before the triceps are fully exhausted, they are still subjected to significant mechanical tension.

You can account for this indirect work by using the concept of fractional sets. As a rough heuristic, count each set of a compound pushing movement as half a set for the triceps, and each set of a compound pulling movement as half a set for the biceps. If the triceps and biceps are already receiving significant indirect volume from compound lifts, then they require fewer isolation sets to maximize their growth. This explains why the dedicated isolation volume for the arms in my sample training routines (see chapter 19) is relatively lower than the volume for the torso muscles.

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16.4. Failure

Muscular failure is the point at which you can no longer complete the concentric portion of a repetition with strict form, despite exerting maximum effort. It is the limit of your capacity at that moment. Note the emphasis on strict form. This is often referred to as technical failure. There is a distinction between technical failure and absolute failure, where you resort to writhing and jerking just to move the load. For our purposes, technical failure is the only failure that matters.

Training to failure ensures that every motor unit within the muscle has been recruited and fatigued. In a calorie deficit, training to failure—or very close to failure—is valuable.[122] Your body is looking for expensive tissue to break down for energy. If you provide a weak stimulus—stopping five or more reps short of failure—then you are essentially telling your body that you have a surplus of muscle tissue that is not required for your daily survival.

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[122] Robinson, Z. P., Pelland, J. C., Remmert, J. F., Refalo, M. C., Jukic, I., Steele, J., & Zourdos, M. C. (2024). Exploring the dose–response relationship between estimated resistance training proximity to failure, strength gain, and muscle hypertrophy: A series of meta-regressions. *Sports Medicine*, *54*(9), 2209–2231. https://doi.org/10.1007/s40279-024-02069-2

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However, training to failure on technical compound movements like squats and deadlifts can lead to technique breakdown and injury. Therefore, failure should be approached with caution on technical compound movements and applied more liberally with isolation and machine exercises.

16.5. Volume

Classically, volume was defined as tonnage, i.e., the total weight lifted (sets × reps × weight). While mathematically satisfying, tonnage is a flawed metric for hypertrophy. A powerlifter doing 10 sets of 3 reps may be doing a similar tonnage as a bodybuilder doing 3 sets of 10, but the physiological stimulus is vastly different.

In modern evidence-based practice, we define volume as the number of hard sets per muscle group per week. A hard set is defined as a set performed with a high level of effort, typically landing within zero to two Reps In Reserve (RIR). In other words, a set only counts toward your volume if you push close to the point of momentary muscular failure, where the involuntary slowing of repetition speed—known as unintended velocity loss—indicates that the high-threshold motor units are being fully recruited and challenged.

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16.6. Absolute intensity

Absolute intensity is a measure of load. It refers to the weight on the bar relative to your one-repetition maximum (1RM). If your 1RM squat is 100 kg, and you are squatting 80 kg, then your absolute intensity is 80%.

For muscle growth, absolute intensity is technically less impactful than once thought; you can build muscle with 60% of your 1RM just as effectively as with 80%, provided that you take those sets close to failure.[123] However, this creates a temptation to train exclusively with lighter weights that I generally advise against.

Higher absolute intensities allow you to reach effective reps (discussed below) much more efficiently. When the load is sufficiently heavy, every repetition counts because the weight requires high-threshold motor unit recruitment from the very first rep. Conversely, with lighter loads, you must perform a significant number of non-stimulative repetitions just to generate enough fatigue to reach the growth-producing reps at the end of the set. Further, higher absolute intensities appear to be superior for improving Bone

[123] Schoenfeld, B. J., Grgic, J., Ogborn, D., & Krieger, J. W. (2017). Strength and hypertrophy adaptations between low- vs. high-load resistance training: A systematic review and meta-analysis. *Journal of Strength and Conditioning Research*, *31*(12), 3508–3523. https://doi.org/10.1519/jsc.0000000000002200

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Mineral Density (BMD), an essential factor for long-term health.[124]

For these reasons—stimulus efficiency and skeletal health—I generally prefer the 5 to 15 repetition range. That said, lighter loads (lower absolute intensity) have a valid place in your programming. If you are working around an injury or simply have a personal preference for the sensation of higher-rep training, then dropping the absolute intensity is a perfectly viable strategy. However, you must remember that progressive overload generally requires you to put more weight on the bar over time. If the weight on the bar stays static for years, then your physique will very likely stay static too.[125]

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[124] Watson, S. L., Weeks, B. K., Weis, L. J., Harding, A. T., Horan, S. A., & Beck, B. R. (2018). High-Intensity Resistance and Impact Training Improves Bone Mineral Density and Physical Function in Postmenopausal Women With Osteopenia and Osteoporosis: The LIFTMOR Randomized Controlled Trial. *Journal of Bone and Mineral Research*, *33*(2), 211–220. https://doi.org/10.1002/jbmr.3284

[125] It is technically possible to achieve progressive overload by continually adding reps to a static weight, but there is no practical reason to do so unless either (a) your access to heavier equipment is restricted; or (b) you are a pharmaceutically enhanced lifter. Because anabolic-androgenic steroids cause muscle strength to increase at a vastly accelerated rate compared to connective tissue adaptation, capping the load and driving progression through higher reps is a sensible precaution to avoid tendon tears.

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16.7. Relative intensity

While absolute intensity is about the weight on the bar, relative intensity is about the effort in the muscle. It quantifies how close a set is to failure. A set of 10 reps at 70% of 1RM might have high relative intensity if you are exhausted, or low relative intensity if you are fresh.

Relative intensity is perhaps the primary variable for muscle preservation. You can reduce volume, you can reduce frequency and you can even reduce absolute intensity slightly, but if you reduce relative intensity, then the training stimulus evaporates. The body follows the SAID principle: Specific Adaptation to Imposed Demands. If the demand does not threaten the muscle's current capacity (high relative intensity), then the body has no reason to keep that expensive, energy-consuming tissue around.

We measure relative intensity by using RPE and RIR (discussed below). A central aim of training during a fat-loss phase is to sustain high relative intensity. You want your sets to be hard. If you finish a set and could have texted your friend while doing it, then the relative intensity was zero, and the set was a waste of time. We are looking for the grind, the point where the bar speed slows involuntarily despite putting in maximum effort. That is high relative intensity.

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16.8. Frequency

Frequency refers to how often you train a specific muscle group or movement pattern within a given timeframe, usually a week. The bro-split, where you annihilate your chest on Monday and do not touch it again until the following Monday, is a frequency of 1x per week. Full-body splits might hit the chest 2x or 3x per week.

Frequency is essentially a tool for volume management. If you need to do 15 sets of quads per week, then doing all 15 sets in one session is likely suboptimal. By the 10th set, you are fatigued, your form is breaking down and the stimulus is trash. Splitting that volume into two sessions of roughly 7 sets lets you perform all sets with higher quality and focus. This is the primary argument for higher-frequency training: it allows for higher-quality volume.

Spreading your volume out can prevent the systemic fatigue that comes from two-hour leg day marathons. However, frequency has to be balanced with joint health. It is easier to go overboard with volume and intensity on a high-frequency routine, potentially leading to overuse injuries.[126]

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[126] Hu, Y., Fu, Z., Torres, M., Luo, W., Tang, B., Zhu, D., Zhao, P., Li, Y., Fong, D. T. P., & Wang, D. (2026). The relationship between training load and injury risk in taekwondo: A systematic review. *BMC Sports Science, Medicine and Rehabilitation*, *18*(1), Article 92. https://doi.org/10.1186/s13102-025-01481-z

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16.9. RIR (Reps In Reserve)

Reps In Reserve (RIR) is a method of quantifying relative intensity or proximity to failure. If you perform a set of squats and rack the bar knowing that you could have completed exactly 2 more reps with good form, then that was a set at 2 RIR. If you grind out the last rep and know you would fail halfway up on the next attempt, then that was 0 RIR.

RIR requires you to know what failure actually feels like. Many trainees underestimate their capacity; they stop at 5 RIR thinking that they are at 1 RIR because it started to burn.[127] To use RIR effectively, you must occasionally test your limits (safely) to recalibrate your internal scale.

16.10. RPE (Rating of Perceived Exertion)

RPE is the inverse of RIR. Based on the Borg scale (originally 6–20, adapted to 1–10 for lifting), it measures the subjective difficulty of a set.

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[127] Zourdos, M. C., Goldsmith, J. A., Helms, E. R., Trepeck, C., Halle, J. L., Mendez, K. M., Cooke, D. M., Haischer, M. H., Sousa, C. A., Klemp, A., & Byrnes, R. K. (2021). Proximity to failure and total repetitions performed in a set influences accuracy of intraset repetitions in reserve-based rating of perceived exertion. *Journal of Strength and Conditioning Research*, *35*(Suppl 1), S158–S165. https://doi.org/10.1519/JSC.0000000000002995

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- RPE 10: maximum effort. Could not do another rep (0 RIR).
- RPE 9: could do 1 more rep (1 RIR).
- RPE 8: could do 2 more reps (2 RIR).
- RPE 7: could do 3 more reps (3 RIR).

Ultimately, they are two sides of the same coin, but RIR is the more intuitive currency. It simply asks you to count what you have left in the tank.

16.11. Effective reps

The concept of effective reps binds many of these terms together. An effective rep is any repetition performed under conditions of maximum motor unit recruitment and high mechanical tension. The theory posits that the body only recruits its high-threshold motor units—the ones with the greatest potential for growth—when it is forced to do so. You can force this recruitment in one of two ways: (1) by imposing a very heavy absolute load; or (2) by using a lighter load and accumulating fatigue until the low-threshold units are exhausted.[128]

[128] Schoenfeld, B. J., & Grgic, J. (2019). Does training to failure maximize muscle hypertrophy? *Strength and Conditioning Journal*, *41*(5), 108–113. https://doi.org/10.1519/SSC.0000000000000473

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According to the popularized model, it is generally only the final five reps prior to muscular failure that are truly effective for hypertrophy.[129] Under this framework, if you perform a set of 12 reps to failure, then the first 7 reps are merely the toll you pay to access those 5 effective reps. Conversely, if you perform a set of 12 reps but stop at 6 RIR, then you performed zero effective reps. You did work, you burned calories, but you provided a negligible signal for muscle growth or retention.

This concept neatly explains why a heavy set of 5 reps and a light set of 20 reps can produce similar muscle growth, provided that both are taken to failure. In the heavy set, the weight is sufficient to force high-threshold motor unit recruitment immediately, meaning that all 5 reps are effective. In the light set, the first 15 reps serve purely as fatigue accumulation to get to those final 5 effective reps.

While the strict five-rep cutoff may be somewhat arbitrary, the effective reps model focuses your attention on the only thing that ultimately matters: the struggle at the end of the set. That struggle is where the change happens.

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[129] Beardsley, C. (2019). *Hypertrophy: Muscle fiber growth caused by mechanical tension*. Strength and Conditioning Research Limited.

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16.12. Rest-pause training

A highly efficient method to accumulate effective reps is the rest-pause set. Here is how it works: you take a weight that you can lift for a moderate number of reps and perform a standard set to failure. You then rack the weight, rest for 15 to 20 seconds (roughly 5 deep breaths), and immediately perform a mini-set to failure with that same load. A solid rule of thumb is to continue these mini-sets until you can no longer manage more than a single rep, at which point the sequence is complete.

Because a rest-pause set allows only an incomplete recovery, it keeps the muscle trapped in a state of high motor-unit recruitment. When you un-rack the bar after a mere 15 seconds, the very first rep you perform is instantly effective.

To understand the efficiency of this method, we can compare it to traditional training. If you perform a standard set but stop at 2 RIR, then you yield only three effective reps per set (the five maximum possible effective reps minus the two that you left in the tank). To accumulate twelve effective reps, you would have to perform four separate sets.

A single rest-pause sequence can yield that same number in a fraction of the time:

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- Initial set: 12 reps to failure (5 effective reps)
- Rest 15 seconds
- Mini-set 1: 3 reps to failure (3 effective reps)
- Rest 15 seconds
- Mini-set 2: 2 reps to failure (2 effective reps)
- Rest 15 seconds
- Mini-set 3: 1 rep to failure (1 effective rep)

In one extended effort, you have accumulated 11 effective reps. You have roughly matched the hypertrophic stimulus of four traditional sets taken to 2 RIR, drastically reducing the time spent in the gym.

16.13. Progressive overload

Progressive overload posits a simple truth: for the body to change, the stress placed upon it must exceed what it has previously encountered and adapted to. The human body is designed for homeostasis; it will not build expensive new muscle tissue or increase its strength reserves unless it is forced to do so by a demand that threatens its current capacity. If you perform the same workout with the same weights and the same reps for a year, then you give your body zero reason to grow new muscle. To continue making progress, the training stimulus must gradually increase over time.

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While most trainees understand this concept, they often mistake it for a mandate simply to add weight to the bar every single session.

While increasing absolute load is the most obvious method of overload, it is not the only one, nor are weekly increases indefinitely sustainable. You can achieve progressive overload by adding repetitions (doing 10 reps with 100 kg instead of 8) or by improving the quality and control of your execution (technique). In fact, purely technical improvement—lifting the same weight with a slower eccentric or a harder contraction—is a potent and often overlooked form of overload.

Even more bizarrely, some trainees mistake progressive overload for simply adding more sets. This is generally an unintelligent strategy for hypertrophy. True progressive overload is a measure of increased capacity over time; it is the journey of taking your bench press from 60 kilograms for 8 reps to 120 kilograms for 8 reps. It is not the process of going from 2 sets with 60 kilograms to 8 sets with 60 kilograms. The former represents a fundamental change in your physiological capability; your muscle has become stronger and larger to handle the load. The latter does not necessarily represent an increase in *any* ability. It often merely signifies a willingness to spend more time in the gym, or worse, indicates that your initial sets were performed with

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such low intensity that you were able to repeat them *ad nauseam*.

In the context of a fat-loss phase, progressive overload takes on a nuanced role. When you are in a calorie deficit, your recovery resources are limited, making it more difficult to add weight to the bar week after week. In this context, success is redefined: maintaining your strength while your body weight decreases is, in itself, a form of progressive overload relative to your mass. If you are 5 kilograms lighter but still squatting the same weight, then your relative strength has increased.

16.14. Key takeaways

- A repetition (or a rep) is a single, complete cycle of a movement, executed through a standardized range of motion at a controlled tempo.
- Sets are a discrete group of repetitions performed consecutively, separated by rest intervals.
- Compound lifts are multi-joint exercises that recruit multiple muscle groups simultaneously.
- Isolation lifts are single-joint exercises that target a specific muscle group directly.
- Failure is the inability to complete a rep with strict form despite maximum effort; training close to failure

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is vital in a calorie deficit to signal the body to retain muscle mass.

- Volume is defined as the number of hard sets performed per muscle group per week, where a hard set is taken to a high level of effort (0–2 reps in reserve).
- Absolute intensity refers to the weight on the bar (relative to 1RM).
- Relative intensity refers to the effort applied (proximity to failure).
- Frequency refers to how often a muscle group is trained per week.
- Reps In Reserve (RIR) is a method to quantify relative intensity by counting the number of quality repetitions left in the tank (e.g., 2 RIR means that you could only complete two more reps if you were to go to failure).
- Rating of Perceived Exertion (RPE) is the inverse of RIR (RPE 10 = 0 RIR, RPE 9 = 1 RIR, RPE 8 = 2 RIR, etc.).
- Effective reps is the theory that only the last five repetitions prior to failure in any given set are truly stimulative for muscle growth.
- Rest-pause training is a highly efficient technique to accumulate effective reps by taking a set to failure, resting briefly (15–20 seconds) and immediately performing follow-up mini-sets to failure with the same load.

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- Progressive overload is the requirement to increase training stress continually for adaptation. In a deficit, maintaining your absolute strength while your body weight decreases is a successful form of progressive overload.

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Chapter 17. What is the least amount of lifting you need to do while dieting?

The main question of this chapter is: 'how little can I train and still keep my muscle while in a calorie deficit?'

We will begin with the answer. For most lifters, muscle can be maintained with roughly one-third of the volume that it took to build it, provided that you maintain the weight on the bar and keep your effort high. In practical terms, this usually means 3–4 standard hard sets (i.e., 0–2 RIR) per muscle group per week.[130]

The rest of this chapter explains the scientific and practical justification for this protocol.

[130] This recommendation represents roughly one-third of a sensible volume target for a dedicated growth phase (approximately 8–12 sets per muscle group per week). This range aligns with meta-analytic data suggesting that there is a dose-response relationship where 5–9 sets yield significant growth and 10 or more sets maximize it (see Schoenfeld, B. J., Ogborn, D., & Krieger, J. W. (2017). Dose-response relationship between weekly resistance training volume and increases in muscle mass: A systematic review and meta-analysis. *Journal of Sports Sciences*, *35*(11), 1073–1082. https://doi.org/10.1080/02640414.2016.1210197).

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17.1. Establishing the retention threshold

Before we can tackle the problem of holding onto muscle while dieting, we first need to establish the retention threshold. We need to find the floor; the lowest amount of work that you can get away with while keeping your capabilities under normal conditions.

To define this limit, we look first to a comprehensive 2021 review by Spiering and colleagues. Their paper, *Maintaining Physical Performance*, cast a wide net, analysing the minimum dose required to preserve a broad range of athletic qualities, including endurance and aerobic capacity. Spiering's general conclusion regarding endurance was that frequency and duration can be reduced significantly—by as much as 66%—without a drop in performance. However, this only holds true if exercise intensity is maintained.[131] In an endurance context, this means the relative cardiovascular effort, typically measured by heart rate or percentage of VO2 max.

Although endurance and hypertrophy are different adaptations, both follow the same principle: once intensity is

[131] Spiering, B. A., Mujika, I., Sharp, M. A., & Foulis, S. A. (2021). Maintaining Physical Performance: The Minimal Dose of Exercise Needed to Preserve Endurance and Strength Over Time. *Journal of Strength and Conditioning Research*, *35*(5), 1449–1458. https://doi.org/10.1519/JSC.0000000000003964

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preserved, the minimum effective dose for maintenance is far lower than the dose required for improvement.

While Spiering provides the general rule for athletic performance, we need evidence from resistance training rather than endurance to understand the maintenance dose for hypertrophy specifically. For this, we turn to the 2011 study by Bickel and colleagues, which is instructive for resistance training adaptations.

Bickel and colleagues wanted to know if people could drastically cut their lifting volume and keep their gains. To find out, they recruited a mix of young adults and seniors for a two-part experiment. For the first four months, everyone trained like a serious athlete, hitting the gym three days a week and hammering their legs with heavy squats, leg presses and leg extensions. This ensured that every participant built a solid foundation of muscle and strength before the real test began.

Then, for an eight-month stretch, the researchers split the participants into three groups to see how much training they could subtract before the muscle started to vanish. One group stopped lifting entirely. A second group cut their workload down to one-third, training only once a week with three sets per exercise. The final group did the absolute bare minimum: just one workout a week, performing only a single

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set for each exercise. This was roughly one-ninth of what they had been doing previously.

For the young adults (ages 20–35), this one-ninth approach was a complete success. Despite doing almost no work—literally just one set of squats, leg presses and leg extensions to volitional fatigue once a week—they held onto virtually all of their size and strength for the entire eight months. However, age proved to be a factor for the older group (ages 60–75). While the one-ninth dose was not quite enough to stop their muscles from shrinking, the one-third group succeeded perfectly. By doing three sets per exercise once a week, the older participants maintained their muscle mass just as effectively as the younger ones.[132]

17.2. Interpreting the one-ninth finding

Synthesizing Spiering's broad conclusions with Bickel's findings gives us a clear hierarchy of training variables. Spiering teaches us that intensity is the primary driver of maintenance across all modalities, while Bickel shows just how elastic volume can be when that intensity is preserved.

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[132] Bickel, C. S., Cross, J. M., & Bamman, M. M. (2011). Exercise dosing to retain resistance training adaptations in young and older adults. *Medicine & Science in Sports & Exercise*, *43*(7), 1177–1187. https://doi.org/10.1249/MSS.0b013e318207c15d

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For a young, healthy person, the data suggest that doing just one hard set of a few main exercises once a week is enough to stop the body from reverting to its smaller state. This supports the premise that maintenance volume is substantially lower than growth volume.

However, translating Bickel's one-ninth finding to a training program is complicated by two factors. First, the volume during the study's growth phase was exceptionally high, with the subjects performing 27 sets per week for their quadriceps. Second, those sets were taken to volitional fatigue, a subjective stopping point that often falls short of true momentary muscular failure. It is therefore difficult to map that one-ninth fraction cleanly onto a conventional, optimized hypertrophy routine.

Further, there is a valid theoretical argument regarding food. It is often argued that maintenance volume is a moving target that changes based on your diet. The theory goes that the tiny amount of training needed to keep your muscle when you are well-fed might be insufficient when you are facing the catabolic stress of a calorie deficit.

At the time of writing, the scientific literature does not offer definitive answers regarding how a calorie deficit impacts volume requirements, nor does it pinpoint precisely how little work you can get away with when underfed. However, I

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am confident in my practical recommendation of 3–4 hard sets per muscle group per week. Assuming that you are taking your sets to or very close to true failure, you are generating a much stronger hypertrophic stimulus per set than Bickel's subjects likely experienced. You do not need to do more volume than Bickel's lowest group; because your sets are harder, 3–4 sets are a safe bet to clear the physiological retention minimum to preserve your muscle mass while you diet.

While a common intuition is to increase training volume to save muscle during a cut, the next sections of this chapter will argue the opposite. As we will explore, there are far more compelling theoretical and practical reasons to conclude that you should actually do less volume while dieting.

17.3. Reducing volume to safeguard performance

In a calorie deficit, your body's recovery resources are scarce. Glycogen stores are depleted, sleep quality often degrades and the hormonal environment becomes less favourable for tissue repair.

In this environment, every additional set incurs a recovery cost that your body cannot easily pay. If you accumulate too

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much volume, then the mounting fatigue will inevitably degrade your performance, i.e., cause a drop in the weight that you can lift or the reps that you can complete. This is to be avoided, because maintaining performance generally equals maintaining tissue.

A common anxiety is that one might maintain strength via improved neural efficiency (skill) even while muscle fibres atrophy. This may be a valid concern for powerlifters testing 1-rep maxes, but it is less relevant for hypertrophy-style training. As supported by Taber and colleagues, myofibrillar hypertrophy is a primary contributor to force production.[133] If you are maintaining your strength in the 5–15 rep range with strict form, then it is physiologically unlikely that you are losing contractile tissue.

Cutting back on your volume ensures that you remain fresh enough to move the same heavy loads you used prior to the diet, without running out of recovery resources. Therefore, the safest strategy while dieting is to reduce volume to safeguard performance.

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[133] Taber, C. B., Vigotsky, A., Nuckols, G., & Haun, C. T. (2019). Exercise-Induced Myofibrillar Hypertrophy is a Contributory Cause of Gains in Muscle Strength. *Sports Medicine*. https://doi.org/10.1007/s40279-019-01107-8

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The viability of a low-volume approach is supported by data. In a 2010 meta-analysis, Krieger found that while multiple sets do produce superior hypertrophy compared to single sets, the curve of adaptation is not linear. A single set provides the majority—roughly 70–80%—of the potential stimulus.[134] Doubling or tripling the volume to chase that final 20% of potential growth yields a terrible return on investment when recovery resources are scarce. This diminishing-returns model is corroborated by a 2017 meta-analysis from Schoenfeld and colleagues, which suggested that while performing 10 or more sets per muscle group per week is optimal for maximizing hypertrophy, low-volume protocols of fewer than 5 sets per muscle group per week, still produce substantial increases in muscle mass.[135]

Growth requires a stronger signal than maintenance; therefore, any stimulus sufficient for growth is, by definition, above the maintenance threshold. If low-volume training is sufficient to construct expensive new tissue, then that same

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[134] Krieger, J. W. (2010). Single vs. Multiple Sets of Resistance Exercise for Muscle Hypertrophy: A Meta-Analysis. *Journal of Strength and Conditioning Research*, *24*(4), 1150–1159. https://doi.org/10.1519/JSC.0b013e3181d4d436

[135] Schoenfeld, B. J., Ogborn, D., & Krieger, J. W. (2017). Dose-response relationship between weekly resistance training volume and increases in muscle mass: A systematic review and meta-analysis. *Journal of Sports Sciences*, *35*(11), 1073–1082. https://doi.org/10.1080/02640414.2016.1210197

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stimulus is *a fortiori*—with even stronger reason—sufficient to prevent the body from scavenging existing tissue. Maintenance is physiologically cheaper than growth. If a low dose can build, then it can certainly preserve.

17.4. Practical benefits of volume reduction

Beyond the studies, there are numerous practical benefits to embracing a low-volume approach while cutting. Anecdotally, I have implemented extremely low-volume training for myself and my clients during steep calorie deficits, and the results have been consistent: zero noticeable muscle loss. The prerequisite, however, is that because you are doing so few sets, those sets must be taken to, or very close to failure (or zero reps in reserve). You cannot coast on a low-volume plan, but if you bring the intensity, then the muscle stays.

Willpower is a finite resource. If you are exhausting yourself in the gym for two hours a day, then your mental vigilance for tracking calories and resisting hunger is depleted. When you spend less time in the gym, you can redirect that mental energy toward the thing that actually drives fat loss: nailing your diet.

As well, when you know that you have 20 sets of legs to do, you unconsciously pace yourself to survive the workout. But

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when you only have two sets to make a difference, there is no room for pacing or junk reps. This forces you to master the skill of going to true muscular failure, which is a permanent upgrade to your training ability that will allow you to stimulate more growth with fewer sets when you eventually return to maintenance or a bulk.

Strategically, low-volume training makes aggressive deficits more tolerable. It allows you to use aggressive strategies like a Protein-Sparing Modified Fast (PSMF; see chapter 14), shedding fat at maximum speed while keeping muscle intact. It also primes you for the rebound. Instead of finishing your diet battered and injured from months of grinding, you finish with healthy joints and high motivation, ready to explode into new growth the moment that you reintroduce calories. Finally, even in the worst-case scenario where a tiny fraction of muscle is lost, the muscle memory safety net ensures that it is not gone forever. Any lost size will bounce back within weeks of eating normally. You have almost nothing to lose and a lot of energy to gain.

17.5. Strategic under-dosing of volume

While 3–4 standard hard sets per week are my recommended safe zone for retaining maximum muscle mass, there is a case for going even lower. Some trainees may

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choose to perform just 1 hard set per week, accepting the risk of minor muscle loss as a calculated trade-off.

Why would you choose to do less than the optimal amount? The answer is simple: adherence. For the average person with a stressful job and limited time, the mental energy required to train hard can compete with the willpower needed to stick to a diet.

If dropping your volume prevents you from burning out and allows you to adhere to your diet perfectly, then the trade-off is worth it. Even if you were to lose a small fraction of muscle tissue, the muscle memory phenomenon discussed above ensures that you can regain that tissue rapidly once calories are restored. This makes strategic under-dosing a viable option for recreational lifters who want to get in and out of a cut as painlessly as possible.

Remember that the relationship between volume and muscle retention is not linear; some training is infinitely superior to none. The first hard set that you perform provides the strongest signal to your body to preserve tissue, while subsequent sets offer diminishing returns. Therefore, even a single hard set per week can stave off the majority of atrophy. For the recreational lifter, this is often an acceptable trade-off for a relatively painless cut.

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If you want to maximize this 1-set approach, then rest-pause training (see §16.12) is your best friend. Rest-pause training, though difficult, lets you preserve your muscle while still reaping the time-saving benefits of a minimalist, 1-set session.

However, a warning applies: unless employing these rest-pause sets, this minimalist approach is not for competitive bodybuilders or physique athletes preparing for a show. In a competitive context, maximum muscle retention is the priority and the calculated risk of atrophy is unacceptable. But for everyone else, the freedom to focus on the diet can often outweigh the marginal cost of lost tissue.

17.6. Managing the psychological side of the deficit

Implementing a low-volume routine while dieting can be a psychological battle. The hardest part is often managing your reaction to the visual deflation caused by glycogen depletion.

When you reduce your training volume and restrict carbohydrates—which is standard in a fat-loss phase—your muscles run low on glycogen. Glycogen is like a sponge that binds water inside your muscle cells. As those glycogen stores drop, your muscles lose that water volume.

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Consequently, they appear smaller, flatter and less pumped than usual.

Many trainees mistake this visual change for muscle loss. Panic ensues, leading them to increase their training volume frantically to get the pump back and reassure themselves that they have not shrunk. This is a mistake. Increasing your workload while in a calorie deficit creates undue fatigue and burns precious energy without restoring the muscle fullness, because the flatness is primarily caused by a lack of carbs, not a lack of training. If you chase the pump here, then you risk pushing your body into true muscle loss. The solution is to trust your logbook. If your strength numbers are holding steady, then your muscle tissue is intact, regardless of how flat you may look. Short-term fluctuations in pump, fullness or rep performance are not indicators of muscle loss; only a sustained strength decline across multiple sessions and multiple exercises warrants adjustment.

17.7. Key takeaways

- Muscle can be maintained with approximately one-third of the volume required to build it, provided that intensity remains high, making low-volume protocols highly efficient during a cut.

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- The practical minimum for muscle retention in a deficit is typically 3–4 standard, hard sets per muscle group per week.
- Dieters can choose to go even lower than 3–4 sets (e.g., 1 hard set per week, ideally using rest-pause techniques) to prioritize diet adherence, accepting the risk of minor, temporary muscle loss that can be quickly regained via muscle memory.
- The safest strategy during a deficit is to reduce volume to safeguard performance. Dropping volume conserves scarce recovery resources, preventing systemic fatigue that would otherwise impair performance.
- Maintaining strength maintains muscle.
- Short-term visual flatness or deflation is due to glycogen/water depletion, not muscle loss. The dieter should trust the logbook: if strength numbers are holding steady, then the muscle tissue is intact.

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Chapter 18. Weight training on a cut

This chapter concerns how to train while in a calorie deficit. I will enumerate the seven rules I stand by to ensure success, before exploring broader considerations to do with programming.

18.1. Rule 1: preserve absolute intensity

The first rule is that you should try your best to preserve absolute intensity. At a bare minimum, this means preventing the weight on the bar from dropping. A mistake that some trainees make when transitioning to a fat-loss phase is lowering the weight and increasing the rep count, trying to burn more calories through lifting or chasing the mythical idea of 'toning'. While an enhanced bodybuilder can often get away with simply chasing a pump to retain their mass—relying on exogenous hormones to provide the primary anti-catabolic signal—make no mistake: this does not work for the natural lifter. To keep your muscle, you generally need to expose it to the same heavy loads that created it. You must signal to your body that maintaining this expensive muscle tissue is necessary for survival, and you can do that by continuing to lift heavy iron. If you are lifting at least the same weights for the same reps while losing body weight, then you can be quite confident that the weight lost is fat, not muscle.

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It is worth noting that some movements like the barbell bench press will often drop in performance during a cut, not because of muscle loss, but due to physics. As you lose body fat, your leverages change: your range of motion increases (a thinner torso means the bar has to travel further) and you lose the passive stability that body fat provides to your joints. Consequently, it is easy to conclude falsely that you are losing muscle when your barbell numbers dip. Including heavy machine work may offset this perception. Because machines lock you into a fixed movement path and provide external stabilization, they are largely immune to these leverage changes. If your barbell bench press takes a hit but your machine chest press holds steady, then you have not lost muscle.

18.2. Rule 2: keep relative intensity high

Closely related to this is the second rule: relative intensity should be high. During a cut, you should be operating within zero to two Reps In Reserve (RIR) and potentially taking sets to absolute failure. Because your body is in an energy deficit, it is looking for reasons to break down muscle tissue for energy. If your training stimulus is weak or casual, then you provide that justification. It is a good idea to train close to your limit to force the body to spare muscle mass.

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18.3. Rule 3: reduce training volume

Because you are training with high intensity while under-fuelled, the third rule is that training volume should be relatively low. Volume can be reduced to roughly one-third of the amount it took to build the muscle in the first place. I recommend performing 3–4 standard hard sets (i.e., 0–2 RIR) per muscle group per week, and even fewer in some cases (see §17.5). This volume might sound shockingly low to those accustomed to high-volume bro-splits, but it is safely above the minimum effective dose required to preserve muscle. Further, low-volume training spares your joints and connective tissue, which are more susceptible to injury when recovery resources are scarce due to dieting.

18.4. Rule 4: keep training frequency to a minimum

The fourth rule is that frequency should be low. You should train a muscle group no more than twice per week. Common splits that work well here include a full-body routine performed twice a week or once every fourth or fifth day, a push/pull/legs split performed three times a week or an upper/lower split performed three to four times a week. The goal is to stimulate the muscle and then back off, allowing ample time for recovery in a system that is currently energy-deprived. Strategically, this reduced schedule also

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allows you to allocate your limited willpower toward the diet rather than the training.

18.5. Rule 5: if progression is on offer, then take it

The fifth rule is that if progression is on offer, then you should take it. In practical terms, this means that if you reach the end of a set and realize that you are capable of performing an additional repetition with flawless technique, or if your performance justifies a fractional increase in load, then it makes sense to capitalize on that rather than voluntarily capping your effort simply because you have already matched last week's logbook entry.

Nothing says that you cannot progress while in a deficit. For anyone other than highly advanced lifters, genuine strength gains are entirely possible during a fat-loss phase. Leaving them on the table can be a missed opportunity, as strength progression over time in moderate rep ranges is the primary driver of muscle growth.[136]

You do not need to force progression blindly—which can be dangerous when energy-deprived—but you should approach every session open to the possibility of growth. That said, the

[136] N.B.: you will rarely, if ever, find a big, weak natural bodybuilder.

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degree of caution you exercise when chasing this progress should scale with both the severity of your calorie deficit and your level of training experience. The more aggressive the deficit and the more advanced the trainee, the more conservative your approach should be. In these scenarios, you should be perfectly content with simply preserving your current numbers.

To be clear, however, a new personal best is only valid if your execution remains pristine; adding an extra rep or more weight to the bar should never come before the strict form standardization discussed in the next rule.

18.6. Rule 6: standardize everything

The sixth rule is to standardize everything. Training is a scientific experiment where you should aim to measure your true strength levels accurately, so you should try to eliminate noisy data by strictly controlling variables such as technique, exercise order, machine settings and rest intervals.

You must resist form creep, i.e., the unconscious urge to reduce range of motion, use momentum or accelerate your tempo to maintain the weight on the bar artificially. If you squat 100 kg to full depth with a controlled, three-second descent one week, and dive-bomb to parallel the next, then

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you have not maintained strength; you have just lowered your standards.

Exercise order should also ideally be fixed, as moving a primary lift to the end of a session will lower performance due to fatigue, creating a false signal of muscle loss. However, you should also be pragmatic. If a busy gym forces you occasionally to perform an exercise out of sequence because a machine is occupied, then do not fret. As long as you train with the standard order the majority of the time, an isolated reshuffled workout is not a big problem. Should it emerge that you hit a personal record on an exercise because you did things in a different order, do not add weight next time; see if you can match that performance when executing the workout in its normal sequence.

Machine settings, too, should be standardized; using a different seat height or footplate angle can alter your leverage and the exercise's resistance profile, making performance comparisons meaningless. It also makes sense to try to keep rest intervals consistent; comparing a set performed after two minutes of rest to one after four is futile, as longer rest allows for greater ATP regeneration and force output.[137]

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[137] Willardson, J. M. (2006). A brief review: factors affecting the length of the rest interval between resistance exercise sets. *Journal of Strength and Conditioning Research*, *20*(4), 978–984. https://doi.org/10.1519/R-17995.1

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Standardizing these elements allows you to turn your logbook into a reliable indicator of progress rather than a collection of random numbers.

18.7. Rule 7: train every muscle group

Finally, the seventh rule is to train every muscle group. In a calorie surplus, your body might maintain a muscle group simply because it has the excess energy to support it. In a deficit, however, your physiology is looking to liquidate expensive tissue to conserve energy. Therefore, the rule is simple: whatever is not trained risks atrophy. If a specific body part is a high priority for your physique—even a small one—then you should train it, or you risk losing it.

I am commonly asked by consulting clients whether they truly *need* to train their legs, usually out of a desire to avoid the fatigue of lower-body training, or from the erroneous belief that leg development is irrelevant to their aesthetic goals. My reply is always that even if you do not care about the visual appearance of muscular legs, there is nonetheless a compelling aesthetic reason to train them: total body recomposition.

Consider a simple thought experiment: imagine a pair of identical twins who weigh exactly the same. One twin trains

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her legs for a year, while the other skips them entirely. At the end of that year, assuming their scale weight is identical, who carries more muscle mass? The twin who trained her legs, of course. And therefore, by mathematical necessity, who carries less body fat? Again, the twin who trained her legs.

Because the lower-body muscles (e.g., the quadriceps, glutes, hamstrings and calves) comprise the largest muscle groups in the human body,[138] training them is exceptionally efficient for fat loss. By forcing your body to retain—or even grow—these formidable muscles, you ensure that a greater percentage of your total weight is composed of lean tissue, driving down your overall body fat percentage. Therefore, preserving or building the mass of your lower half is an efficient physiological route to revealing the definition of your upper half.

18.8. On the importance of the logbook

The single most valuable tool in your gym bag is your logbook. Whether this takes the form of a physical notebook, a spreadsheet on your phone or a dedicated training app, its function is indispensable. You should record every exercise, every set, every rep and every load lifted.

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[138] Janssen, I., Heymsfield, S. B., Wang, Z., & Ross, R. (2000). Skeletal muscle mass and distribution in 468 men and women aged 18–88 yr. *Journal of Applied Physiology*, *89*, 81–88. https://doi.org/10.1152/jappl.2000.89.1.81

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Many trainees operate on feel, wandering into the gym and selecting a weight that feels heavy enough for today. The flaw here is that human memory is fallible and your internal gauge of difficulty is unreliable, especially in a deficit. You might think that you did 10 reps last week, but if you actually did 12 and you settle for 10 today because of fatigue, then you have just provided a weaker signal to your body. In a game of inches like natural bodybuilding, these small data deficits can accumulate into large physique deficits. The logbook prevents this drift by acting as an objective anchor; it demands that you match the actual numbers, regardless of the untruths that your memory or fatigue are telling you.

When you walk into the gym and look at your log, you see exactly what you achieved last session. Your entire goal for the current session is to match that logbook or beat it by one rep, by one kilogram or by better technique.

Without this data, the progression schemes below are useless. You cannot apply a double-progression scheme if you do not know where you started.

It is worth addressing that for some, the logbook can be a source of anxiety, often stemming from the pressure to beat your past performance every time you train. If you find yourself stressing over the numbers, then remember that

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progress is rarely perfectly linear. Minor strength fluctuations from week to week are entirely normal. Do not be disheartened by an 'off' session; instead, zoom out and look at the macro-trend. Over time, your logbook should show a clear, upward trajectory.

Last, in a fat-loss phase, the logbook is your objective reality. When you feel small, flat and weak due to the calorie deficit, your feelings will lie to you. You might feel as if you are losing muscle. But if you open your logbook and see that your strength numbers are identical to four weeks ago, then you have empirical proof that your muscle is safe. The logbook cuts through the emotion and gives you the data you need to stay the course.

18.9. Progression in the weight room

While my seven rules above set some boundaries for your training, they do not tell you when to add weight to the bar. For that, we need a progression scheme.

Below are the four primary progression models that I use with clients.

18.9.1. Simple double progression

For the majority of trainees, and especially beginners, I recommend the simple double progression model. To

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execute this, you select a rep range—say, 5 to 8 reps—and a weight that lands you somewhere in the middle. Your goal is to stay with that specific weight until you can hit the top number of the rep range (the ceiling) for every single set with perfect technique. Once you achieve that ceiling across all sets, you have earned the right to add a small increment of weight in your next session. Naturally, the heavier load will make the exercise harder, dropping your performance back down to the bottom of the rep range (the floor). Your only goal for the subsequent weeks is to build your strength back up until you hit the ceiling again, at which point the cycle repeats.

For example, imagine you are performing a dumbbell chest press for three sets with a target range of 5 to 8 reps. In week one, using 20-kilogram dumbbells, you manage sets of 8, 7 and 6. You did not hit the ceiling (8) on all sets, so you keep the weight the same for week two. In week two, you fight for those extra reps and manage 8, 8 and 7. Still not quite there. Finally, in week three, you manage 8, 8 and 8. You have now graduated. In week four, you grab the 22.5-kilogram dumbbells. Because of the load increase, your reps drop to 6, 6 and 5. This is expected. The cycle repeats. In a deficit, this process might take weeks. That is fine. As long as the numbers are not sliding backward, you are winning.

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18.9.2. The single-set AMRAP

For trainees who are psychologically and physically prepared to train to failure safely, I highly recommend performing a single-set AMRAP (As Many Reps As Possible). This is exceptionally effective for cutting because it prioritizes high intensity with managed volume.

After your warm-up, you perform a single, all-out top set, i.e., an AMRAP set aiming for a specific rep target, generally around 8 reps. You give this one set everything you have. Once it is complete, you move on to your next exercise. There are no back-off sets.[139]

Hitting your rep goal does not mean stopping the set. An AMRAP means exactly that: as many reps as possible. You keep going until you reach 0 RIR (Reps In Reserve), even if that means exceeding your rep target. Because of this, it often makes sense to start a new cycle slightly conservatively, selecting a starting weight that you are certain you can beat the rep target with. This builds momentum and gives you a

[139] I make an exception for those training with limited equipment. If you are restricted to just one movement for a given muscle group—for example, you only have access to a leg press and cannot move on to a leg extension to finish off your quads—then you can perform a back-off set to ensure an adequate stimulus. In this scenario, simply slash the weight by 10 percent after your top set, rest 3 minutes and perform a second AMRAP set with the lighter load.

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runway to progress consistently over the coming weeks without stalling out immediately.

The progression logic is simple: you only add weight to the bar next week if you meet or exceed your rep goal on the top set. If your goal is 8 reps and you hit 8 (or more), then you increase the weight next time. If you only hit 6 or 7, then you keep the weight the same and try again next session.[140] This scheme ensures that you are always pushing for a personal best when you are freshest, maximizing mechanical tension without accumulating the fatigue that comes from multiple sets.

18.9.3. The monthly failure test

I understand that not everyone is comfortable taking every set to the point where they fail a lift. However, strict avoidance of failure creates a blind spot: calibration. Many people are terrible at estimating how many reps they have left in the tank.[141] You might feel as if you are training hard,

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[140] If you are performing a back-off set, then it is not progressed independently. Its weight depends on the top set; when the top set goes up, the back-off set naturally goes up with it, remaining locked in at a 10 percent reduction.

[141] Zourdos, M. C., Goldsmith, J. A., Helms, E. R., Trepeck, C., Halle, J. L., Mendez, K. M., Cooke, D. M., Haischer, M. H., Sousa, C. A., Klemp, A., & Byrnes, R. K. (2021). Proximity to failure and total repetitions performed in a set influences accuracy of intraset repetitions in reserve-based rating of perceived exertion. *Journal of Strength and Conditioning Research*, *35*(Suppl 1), S158–S165. https://doi.org/10.1519/JSC.0000000000002995

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but in reality, you might be stopping five or six reps short of true failure. If you never test your limits, then you are stabbing in the dark; you cannot accurately aim for 2 reps in reserve if you do not know where 0 reps in reserve actually lives.

For trainees who have become uncomfortable with the constant grinding required in the above two progression models, I suggest a modified approach to the basic double progression scheme that uses a monthly failure test. You will still use a rep range (e.g., 9–12), aiming to add weight if you max out the rep range on all sets, but you do not push your sets to failure most of the time (stopping each set at around 1–2 RIR). However, roughly once a month—or whenever you feel particularly energetic—you take that very last set of any given exercise to absolute failure.

If you were aiming for a ceiling of 12 reps, but on your failure set you manage to grind out 15, then you know you have been sandbagging. You were not working at the intensity you thought you were. If you exceed the top of your rep range by three or more reps during this check, then it is a mandatory signal to add weight next time, regardless of what happened in your earlier sets. This ensures that even if you generally prefer to train a bit shy of failure, your loads eventually catch up to your actual strength levels.

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If you opt for this progression scheme, then it may make sense to raise your volume slightly to account for the generally lower intensity. To ensure an adequate stimulus, you can perform up to five or six sets per body part per week rather than my standard recommendation of three to four sets.

18.9.4. Barbell compound lifts

Barbell compound exercises—e.g., squats, bench presses and deadlifts—should not be pushed to absolute muscular failure by anyone other than advanced trainees who possess the body awareness to fail without technique breakdown. For the majority of people, failing a squat is a safety hazard that outweighs the benefit of that final effective rep.

For these lifts, progression should be based on bar velocity, i.e., the speed at which the weight moves. You likely know the feeling: the first rep of a set flies up, but the last rep is a slow, shaking grind. We want minimal exposure to that slow grind on heavy barbell compounds.

For instance, if your program calls for 3 sets of 5 reps on the squat, then pay close attention to the speed of the bar. If the fifth rep of your third set moves with the same crisp, explosive speed as the first rep of your first set, then you have mastered that weight. The absolute intensity was not

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high enough to degrade your speed, meaning that you have reserve strength. In this case, you can add weight next time. However, if the bar speed slows perceivably on the final reps despite exerting maximum effort—if you have to fight through a sticking point—then you have received a sufficient stimulus. You should stay at that weight for the next session.

18.10. The increment question

How much weight should you add when you earn a progression? In a fat-loss phase, patience is a virtue. Do not attempt to go up by five or ten kilograms unless you obliterated your previous target. Generally, an increase of about one percent is sufficient. If you are lifting 200 kilograms, then a 2-kilogram increase is plenty. If your gym does not have micro-plates, then simply use the smallest increment available to you.

18.11. Warming up

Your warm-up should not be a workout in itself. The extensive warm-up routines popularized in powerlifting circles are largely unnecessary for most exercises performed in moderate rep ranges.[142] For most exercises, two quick sets

[142] Iversen, V. M., Norum, M., Schoenfeld, B. J., & Fimland, M. S. (2021). No time to lift? Designing time-efficient training programs for strength and hypertrophy: A narrative review. *Sports Medicine*, *51*, 2079–2095. https://doi.org/10.1007/s40279-021-01490-1

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are sufficient: one at roughly 50% of your working weight for a few reps, and a second at 75% for a few reps. Personally, I also like to perform a single repetition with my working weight before starting my working sets. The repetitions on these warm-up sets should be kept low to avoid a premature pump or fatigue. Once the first heavy compound movement of the session is complete, most trainees will find that the body is systemically warm. For any subsequent exercises targeting the same muscle group, you can move directly into your working sets or, at most, perform a single submaximal 'feel' set to calibrate your form. You are in the gym to lift heavy and leave; do the bare minimum warm-up required to handle the iron safely, then get to your work.

18.12. Rest intervals

A mistake some dieters make is deliberately shortening their rest intervals to keep their heart rate elevated, hoping to turn their lifting session into a makeshift cardiovascular workout to burn more fat. This is counterproductive. As established, the primary goal of the weight room during a phase of energy restriction is muscle preservation, not calorie expenditure. To signal your body to retain muscle tissue, you must maintain your performance, and you cannot lift heavy weights if you are inadequately recovered from your previous set.

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If you cut your rest intervals too short, then your cardiovascular system or local metabolic fatigue becomes the limiting factor rather than the target muscle. You will end up failing the next set simply because you are out of breath or because the muscle is choked with lactic acid, not because the muscle fibres have reached their mechanical limit. This forces you to lift lighter weights or perform significantly fewer repetitions, compromising the mechanical tension required to hold onto your muscle.

Therefore, your rest intervals should be long enough to allow for near-complete recovery of the cardiovascular system and the target muscle. As a general heuristic for duration, heavy compound movements require the longest rest intervals. You should generally rest around 3 minutes between these sets. Isolation and machine exercises, conversely, generally do not require as much rest. For these, 1.5 to 2 minutes of rest are typically sufficient.[143]

18.13. Injury

This book is not intended to be a magnum opus on injury prevention or rehabilitation; I am not a physical therapist.

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[143] Senna, G. W., Willardson, J. M., Scudese, E., Simão, R., Queiroz, C., Avelar, R., & Martin Dantas, E. H. (2016). Effect of different interset rest intervals on performance of single and multijoint exercises with near-maximal loads. *Journal of Strength and Conditioning Research*, *30*, 710–716. https://doi.org/10.1519/jsc.0000000000001142

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However, as a rough guide for the trenches, if you experience pain worse than a three out of ten during a set, then stop. Do not try to be a hero, especially while in a calorie deficit when your recovery capacity is already compromised. If a specific movement causes pain, then you generally have two immediate options. First, swap the exercise for a biomechanically similar variation that does not aggravate the area; if back squats hurt, then switch to a leg press or a lunge. Second, if you are intent on keeping the movement, then drop the weight, slow down the tempo, introduce a pause before the concentric motion and perform higher reps. If the pain persists despite these adjustments, then seek professional medical advice.

18.14. Training during a diet break

When you implement a diet break—raising your calories back up to maintenance levels for a week or two (see chapter 28)—you will almost certainly feel a sudden surge of energy. The mental fog lifts and your motivation returns. The temptation, therefore, is immediately to ramp up your training: to add extra sets, throw in another workout day or test your one-rep maxes because you finally have the fuel to do so.

Do not do this.

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The entire purpose of a diet break is to allow systemic fatigue to dissipate and to give your hormonal environment a chance to normalize. If you drastically increase your training stress the moment that you increase your food, then you negate the restorative benefits of the break. You are essentially using the extra fuel to dig a deeper hole, rather than filling in the one you have already dug.

During a diet break, you only have two viable options regarding your training: either (a) change nothing; or (b) take a deload.

18.14.1. Option A: change nothing

If you are merely experiencing the standard, expected lethargy of a fat-loss phase, then keep your training schedule, volume, exercise selection and intensity the same as they were during the deficit. Enjoy the fact that the weights feel lighter and your recovery between sessions is faster, but do not alter the program. Let the food do its job of healing you, not fuelling more work.

18.14.2. Option B: take a deload

If your joints are aching, your motivation to train has evaporated and the weights that moved smoothly a month ago suddenly feel glued to the floor, then eating more food

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while maintaining your training intensity will not be enough. In these instances, it makes sense to take a deload.

A deload is a planned, temporary reduction in training stress—typically lasting one to two weeks—that targets mechanical and neurological fatigue. You achieve this by intentionally dropping your training volume (reducing the number of working sets), your intensity (reducing the weight on the bar and staying further away from failure) or a combination of both.

Pushing blindly through significant physical fatigue courts injury and psychological burnout. Implementing a deload gives your nervous system a chance to downregulate and allows soft tissues to heal. This brief step back ensures that when you return to your normal routine, your body is primed to progress.

18.15. Intro weeks

The excitement of starting a new program often tempts lifters to sprint out of the gates at maximum intensity. They push every set to absolute failure and wake up the next day crippled by Delayed-Onset Muscle Soreness (DOMS). This is a misstep that can compromise the rest of the training block, and where the concept of the intro week becomes useful.

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An intro week is an introductory week to a training cycle, designed gently to acclimatize the body to the physical stress of the program.

To execute a successful intro week, I like trainees to perform their working sets with one more Rep In Reserve (RIR) than normal. If their target intensity for a given exercise during the main block is 0 RIR (leaving zero reps in the tank), then they will deliberately stop their sets at 1 RIR during the intro week. If the program calls for 1 RIR, then they will execute the intro week at 2 RIR. You are still working hard, but you are holding back just a fraction more than usual.

Backing off the relative intensity by one rep gives your joints and connective tissues a chance to adapt to the new mechanical tension before you begin pushing them in the weeks to follow, while still providing a robust signal for muscle retention.

18.16. Key takeaways

- When cutting:
    - maintain the heavy loads that you lifted before the diet;
    - operate consistently within 0–2 Reps In Reserve (RIR);

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    - seize any opportunity to add a rep or small load increase, provided that execution remains pristine;
    - keep volume low (typically 3–4 hard sets per muscle group/week);
    - keep frequency low (train each muscle no more than twice per week);
    - standardize everything (e.g., exercise technique, exercise order, machine settings and rest intervals); and
    - train every muscle group.
- Write down your workouts in a logbook.
- Use an objective progression scheme, e.g., double progression, where you first increase repetitions with a given weight until you hit the top of a prescribed rep range, and only then increase the weight.
- Keep warm-ups brief.
- During a planned diet break (when calories are raised), do not increase the training stress; either change nothing or take a deload to maximize recovery.

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Chapter 19. Sample training routines

You will notice that the routines below are simple. That is by design. Fundamentally, I do not believe in complicated training routines filled with bells and whistles, nor do I rely on complex spreadsheets that constantly vary rep ranges, RIR targets, set counts, rest intervals or exercise selection. Progress does not depend on complexity; in fact, constantly altering the training stimulus often yields inferior results for three main reasons:

> (1) standardization becomes impossible, making it difficult to know whether you are applying progressive overload;
> (2) when progress stalls, it is harder to identify the problem and implement the corrective measure; and
> (3) frequent exercise variation traps your nervous system in a perpetual state of motor learning, which compromises your ability efficiently to recruit and fatigue the target muscle.

Progress is best achieved by picking a handful of effective movements and driving the numbers up over time.

To accommodate different life schedules and recovery capacities, I have written several routines for different training frequencies: two, three and four times a week. The

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best frequency is simply the one that you can adhere to without missing sessions; a two-day program executed perfectly is infinitely superior to a four-day program that you skip half of the time.

The specific exercises listed in these tables are merely placeholders. There is no magical property inherent to a leg press that cannot be replicated by a hack squat. You should feel free to substitute exercises based on your equipment availability and biomechanics, provided that they meet four specific criteria:

- Does the movement accurately hit the intended muscle group?
- Can you add weight in small increments to apply progressive overload?
- Is the movement stable enough to allow you to push to failure without losing your balance?
- Does it feel safe on your joints? (If a movement consistently hurts you, then discard it.)

If I list a machine chest press but your gym lacks one, or if that specific machine irritates your shoulder, then swap it for a flat dumbbell press or a weighted dip. The movement pattern and the intensity are what matter; the specific tool you use to generate that intensity is entirely up to you.

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Last, please note that the rest intervals listed in the routines below apply not only to the rest taken between sets of the same exercise, but also to the transition time between different exercises.

19.1. Beginner routines

The full-body routines below are designed to be performed on two non-consecutive days (e.g., Monday and Thursday).

19.1.1. Beginner commercial gym routine (2x per week)

Exercise	Sets	Reps	Rest interval
Leg press	1–2	8–12	1.5 min
Leg curl	1–2	8–12	1.5 min
Chest press	1–2	8–12	1.5 min
Seated cable row	1–2	8–12	1.5 min

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Dumbbell lateral raise	1–2	8–12	1.5 min
Triceps pressdown	1	8–12	1.5 min
Biceps curl	1	8–12	1.5 min
Crunch	1–2	8–12	1.5 min
Back extension	1–2	8–12	1.5 min

19.1.2. Beginner home gym routine (2x per week)

This routine is ideal for beginners with limited equipment or those travelling.

It is entirely possible to build an impressive physique outside of a commercial gym. In fact, from 2020 to 2026, I trained exclusively at home with nothing but a barbell, some weight plates, a rack and an adjustable bench, and I got good results. If you find that you enjoy training at home, then you can eventually augment your home gym with adjustable dumbbells, a barbell, some weight plates, a rack and an adjustable bench. This modest setup will provide all the

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resistance you need to allow for continuous progression for years to come.

The routine below, however, assumes that you do not yet own this equipment and are limited to body weight, resistance bands and dumbbells. Because body weight exercises provide a fixed amount of resistance, you should not stop simply because you hit an arbitrary number. Instead, perform each set until you are 1 or 2 repetitions short of technical failure. As a beginner, there is no need to push to complete exhaustion.

If you cannot perform 8 reps of an exercise with good form, then the variation is too hard, and you should step back to an easier progression.

If you can comfortably perform 30 or more reps of an exercise, then it is advisable to advance to a more challenging variation in your next workout.

Exercise	**Sets**	**Reps**	**Rest interval**
Goblet squat *or* **lunge**	1–2	8–30+	1.5 min

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Body weight glute bridge	1–2	8–30+	1.5 min
Push-up (kneeling, incline or standard)	1–2	8–30+	1.5 min
One-arm dumbbell row *or* **resistance band row** *or* **inverted row** *or* **chin-up**	1–2	8–30+	1.5 min
Dumbbell lateral raise *or* **resistance band lateral raise**	1–2	8–30+	1.5 min

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Lying dumbbell triceps extension *or* **resistance band triceps pressdown**	1	8–30+	1.5 min
Dumbbell biceps curl *or* **resistance band biceps curl**	1	8–30+	1.5 min
Crunch	1–2	8–30+	1.5 min
Bird dogs	1–2	8–30+	1.5 min

19.2. Intermediate/advanced full-body routine (1.5–2x per week)

This routine is designed for the experienced trainee who knows how to generate maximum intensity but needs

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maximum recovery. It can be performed two times per week, or once every fourth or fifth day.

Exercise	Sets	Reps	Rest interval
Hack squat *or* leg press	1	5–8	3 min
RDL *or* leg curl	1	5–8	3 min
Machine chest press	1	5–8	3 min
Machine row	1	5–8	3 min
Leg extension	1	9–12	1.5 min
Leg curl (variation)	1	9–12	1.5 min
Incline chest press	1	9–12	1.5 min

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***or* chest flye**			
Lat pull-down	1	9–12	1.5 min
Dumbbell lateral raise	2	7–10	2 min
Cable face pull	1	7–10	2 min
Triceps pressdown	1	9–12	1.5 min
Incline dumbbell curl	1	9–12	1.5 min
Calf raise	1	7–10	2 min
Seated calf raise	1	7–10	2 min
Cable crunch	2	9–12	1.5 min

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Back extension (do not push to failure)	1–2	9–12	1.5 min

19.3. The upper/lower split (3–4x per week)

This split divides your training into two sessions: upper body (chest, back, shoulders, arms) and lower body (legs, core). It is versatile and can be performed either three or four days per week depending on your schedule and recovery capacity.

Option 1: the 4-day schedule (standard)
This is the most common implementation, allowing you to hit every muscle group twice per week. You perform each session twice, typically with a rest day in the middle.

- Monday: lower
- Tuesday: upper
- Wednesday: rest
- Thursday: lower
- Friday: upper
- Saturday: rest
- Sunday: rest

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Option 2: the 3-day schedule (rotating)
If you can only commit to three days, or if your recovery is poor due to a steep calorie deficit, then you can run this on a rotating schedule. You simply train on three consistent non-consecutive days (e.g., Mon / Wed / Fri) and alternate between lower and upper sessions.

Because you have an odd number of training days, the schedule does not reset perfectly every week. Instead, it operates on a two-week cycle:

- Week A: lower / upper / lower
- Week B: upper / lower / upper

This ensures that every muscle group is stimulated three times every two weeks (an average frequency of 1.5x), which is sufficient for maintenance while providing four full days of rest per week.

Session A: lower body

Exercise	Sets	Reps	Rest interval
Hack squat *or* **leg press**	1	5–8	3 min

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RDL *or* leg curl	1	5–8	3 min
Leg extension	1	9–12	1.5 min
Leg curl (variation)	1	9–12	1.5 min
Calf raise	1	7–10	2 min
Seated calf raise	1	7–10	2 min
Cable crunch	2	9–12	1.5 min
Back extension (do not push to failure)	1–2	9–12	1.5 min

Session B: upper body

Exercise	Sets	Reps	Rest interval

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Machine chest press	1	5–8	3 min
Machine row	1	5–8	3 min
Incline chest press *or* chest flye	1	9–12	1.5 min
Lat pull-down	1	9–12	1.5 min
Dumbbell lateral raise	2	7–10	2 min
Cable face pull	1	7–10	2 min
Triceps pressdown	1	9–12	1.5 min
Incline dumbbell curl	1	9–12	1.5 min

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19.4. The push/pull/legs split (3x per week)

This split divides the body into three functional categories: pushing muscles (chest, shoulders, triceps), pulling muscles (back, biceps) and legs (quadriceps, glutes, hamstrings, calves, core).

Because there are three distinct workouts, this fits perfectly into a standard 3-day weekly schedule (e.g., Monday, Wednesday, Friday). Every muscle group is hit directly once a week.

Session A: push (chest, shoulders, triceps)

Exercise	Sets	Reps	Rest interval
Machine chest press	2	5–8	3 min
Incline chest press *or* **chest flye**	1–2	9–12	1.5 min
Dumbbell lateral raise	2	7–10	2 min

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Triceps pressdown	1–2	9–12	1.5 min

Session B: legs (quadriceps, glutes, hamstrings, calves, core)

Exercise	Sets	Reps	Rest interval
Hack squat *or* leg press	2	5–8	3 min
RDL *or* leg curl	2	5–8	3 min
Leg extension	1–2	9–12	1.5 min
Leg curl (variation)	1–2	9–12	1.5 min
Calf raise	2	7–10	2 min
Seated calf raise	1–2	7–10	2 min

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Cable crunch	3–4	9–12	1.5 min
Back extension (do not push to failure)	3–4	9–12	1.5 min

Session C: pull (back, biceps)

Exercise	Sets	Reps	Rest interval
Machine row	2	5–8	3 min
Lat pull-down	1–2	9–12	1.5 min
Cable face pull	1–2	7–10	2 min
Incline dumbbell curl	1–2	9–12	1.5 min

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19.5. A note on neck, traps and forearm training

You will notice the absence of direct isolation work for smaller muscle groups such as the neck, upper trapezius and forearms. I have omitted these simply to keep the core routine streamlined and time-efficient.

However, if you have the time, then you may add them at your discretion. A good rule of thumb is to add 1–2 sets of wrist curls/extensions, shrugs or neck work (flexion, extension and lateral flexion) at the very end of your session.

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Chapter 20. My personal fat loss regimen

While the previous chapters have outlined the physiological mechanisms of fat loss and muscle preservation, this chapter is purely anecdotal. This is my regimen during fat-loss phases. It is not a prescription for every reader, but rather the application of the principles I advocate, tailored to my specific psychology and constraints.

20.1. My diet

I am not one for moderation when a goal is in sight. I do not see the appeal in dragging out a moderate deficit for months on end, lingering in a chronic state of low-grade hunger. I prefer to strip the body fat off quickly and return to a life of stable abundance as soon as possible. Consequently, when I decide that it is time to get lean, I aim for maximum efficiency. Until I reach my goal, I use a Protein-Sparing Modified Fast (PSMF; see chapter 14) for as many days as I can muster. Counterintuitively, far from being miserable, I find this aggressive approach to be vastly better overall. Not only do I find that it reliably kills cravings and blunts hunger, but it also often produces a sense of focus and euphoria, which comes from the undeniable momentum and rapid, visible results. I adhere to the PSMF with only two exceptions: (1) when the psychological pressure mounts to a

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point where adherence is about to snap; or (2) when I am invited to social gatherings. Even then, I do not treat an outing with friends as an excuse for a full maintenance day. If I have to eat a bit extra, then I simply eat as close to the PSMF parameters as possible given the social constraints, which often still results in a net deficit for the day. It is only when absolutely necessary that I take a full step back and eat at maintenance.

My default dietary cadence is two meals a day, which allows for substantial meal sizes that actually signal satiety rather than grazing on bird-like portions throughout the day. However, as I push into the single-digit body fat percentages, hunger can become the enemy of my sleep. If I am getting extremely lean, then I sometimes switch to one meal a day, saving my entire calorie allotment for a singular window to ensure that I can go to bed with a full stomach.

Whether I am in a deficit, at maintenance or in a deliberate surplus, I weigh everything. When I am at maintenance, my food choices become more relaxed, but the food scale is always there. I take it wherever I go. Every morsel I eat is tracked, even on my birthdays and other special occasions. This practice, which I have now done for years, has helped me tremendously. It guarantees that maintenance does not slowly creep into an accidental surplus, and it ensures that an

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intentional surplus does not spiral into unmeasured, excessive fat gain.

20.2. My training

As to training, my approach during a fat-loss phase depends on where bodybuilding ranks on my list of priorities at any given time.

When bodybuilding is at the forefront of my life, I train at a commercial gym. Under these conditions, my routine is identical to the methodologies I described in the training chapters of this book. I perform three to four sets per muscle group per week, usually taken to zero RIR or failure.

Conversely, when bodybuilding is less of a priority and my schedule is consumed by other obligations—between law school, writing this book, managing my consultation practice and producing YouTube content—I train at home. I rely solely on free weights and body weight exercises and employ a four-day upper/lower split. These are brief, intense workouts where I perform just one to two all-out sets per muscle group per week, frequently using the rest-pause technique. If the intensity is high enough—if you are truly taking the muscle to failure—then the volume required to maintain your physique is shockingly low.

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Finally, regarding cardio, I do not run and I do not cycle, except for short commutes. I pace. My Non-Exercise Activity Thermogenesis (NEAT) is high by default because I struggle to sit still. I pace when I am thinking and I pace when I am talking. As a matter of fact, I am pacing as I write this very passage. This constant low-level activity accounts for a significant portion of my daily expenditure, allowing me to eat more while maintaining leanness without ever stepping on a treadmill.

Find what is sustainable for you, but do not be afraid of the extremes if they suit your psychology. For me, the fastest way out of the fire is to run through it.

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Chapter 21. Why and how to track calories and macronutrients

This chapter introduces perhaps the most powerful tool in your fat loss arsenal: the practice of tracking your intake. While often maligned as tedious or obsessive, using a food scale and a digital tracking application to monitor calories and macronutrients is a highly advantageous practice that replaces subjective guesswork with objective, quantifiable data. When you track, you stop approximating your intake and start managing it with mathematical certainty.

21.1. The failure of intuition

To understand why tracking is so valuable, we need to begin by accepting that we are terrible at estimating how much we eat. This incompetence makes biological sense. For most of human history, food was scarce. Our brains are wired to seek out calorie-dense foods and to consume them in quantities that ensure survival through potential famines. We are evolved to eat, not to restrict. Consequently, our internal calorie counters are woefully inaccurate in the modern food environment.

Studies have demonstrated this amnesia of the fork. When asked to recall what they ate in a day, people consistently underreport their intake, often missing the mark by thirty to

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fifty percent.[144] Indeed, even dietitians underreport their daily energy consumption by hundreds of calories when evaluated against their actual energy expenditure.[145] We forget the handful of almonds that we grabbed while passing by the pantry. We ignore the olive oil used to sauté the vegetables. We underestimate the calorie density of sauces, dressings and beverages. We perceive a healthy meal as a low-calorie meal, confounding nutritional quality with energy density. A bowl of granola with avocado and nuts looks and sounds healthy and virtuous, and it may indeed be packed with micronutrients, but it can easily contain more energy than a fast-food burger.[146] Without a mechanism to capture these data, we are oblivious to the discrepancy between what we think we are consuming and what is actually entering our system.

Tracking eliminates this ambiguity. When you log every bite into an app, you are forced to confront the data. You see that

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[144] Lichtman, S. W., Pisarska, K., Berman, E. R., Pestone, M., Dowling, H., & Offenbacher, E. (1992). Discrepancy between self-reported and actual caloric intake and exercise in obese subjects. *The New England Journal of Medicine*, *327*(27), 1893–1898. https://doi.org/10.1056/NEJM199212313272701

[145] Champagne, C. M., Bray, G. A., Kurtz, A. A., Monteiro, J. B. R., Tucker, E., Volaufova, J., & Delany, J. P. (2002). Energy intake and energy expenditure. *Journal of the American Dietetic Association*, *102*, 1428–1432. https://doi.org/10.1016/s0002-8223(02)90316-0

[146] Other foods that fall into this category of healthy-but-calorie-dense include protein balls, trail mix, energy bars, hummus, pesto, guacamole, fruit juices, smoothies, açaí bowls, nut butters, flaxseeds and dried fruit.

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the ‘splash’ of cream in your coffee, after weighing it, is actually a hundred calories. You realize that your ‘light’ lunch was actually half of your daily allowance. This clarity is often shocking, but it is also liberating. It removes the frustration of ‘doing everything right’ but not seeing results.

21.2. The energy budget

Tracking calories provides you with a visible, manageable energy budget. Just as you can manage your finances by tracking income and expenses, you can manage your body composition by tracking energy intake with an app. Every meal is a transaction. You can spend your calories however you like, but once the budget is gone, you must not spend more, else you will be in debt.

Instead of vague rules like ‘eat clean’ or ‘cut down on carbs’, you have a flexible, quantifiable boundary. If you want to eat a slice of pizza, then you can. You simply log it, see how much of your budget it consumes and adjust the rest of your day accordingly. Tracking allows for a diet that is inclusive rather than exclusive, preventing the binge-restrict cycle that sometimes accompanies rigid food rules. You learn that no single food makes you fat, just as no single purchase makes you bankrupt. It is the accumulation of choices over time that determines the outcome.

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21.3. The game of Macro Tetris

Knowing what to eat is distinct from the practical reality of how to eat it within a finite budget. This is where it helps to conceive of tracking as a game of Macro Tetris.

In this game, your calorie limit is the size of the board, and your macronutrients are the falling blocks. The objective is to fit your required protein into the grid while manoeuvring carbohydrates and fats to fill the remaining space effectively. There are no 'good' or 'bad' foods in this framework; there are simply pieces of varying shapes and sizes that must be fit into the puzzle.

Viewing nutrition in this way lets you strategize. You realize that a doughnut is simply a large, awkwardly shaped block that takes up a substantial portion of your carbohydrate and fat allowance. You can choose to place it on the board, but you must acknowledge that it forces you to play differently for the rest of the day. You will need to surround that calorie-dense block with lean, high-volume foods—egg whites, fibrous vegetables, lean poultry or fish—to ensure that you hit your protein target without exceeding your calorie limit.

This gamification creates a feedback loop of nutritional literacy. You quickly learn that while you can fit a fast-food

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burger into your numbers, doing so might leave you with only 200 calories for dinner, forcing you into a corner where hunger is inevitable. Conversely, you learn the value of high-volume foods because they are efficient. They are small, flexible blocks that allow you to fill the board and feel satiated without hitting the ceiling.

The Tetris approach grants you autonomy. It replaces the anxiety of vague dietary rules with the clarity of a budget. You are no longer wondering if you are allowed to have dessert; you simply look at the board, assess the remaining space and decide if you can make the pieces fit. If the piece fits, then you can eat it. If it does not, then you adjust the plan for tomorrow.

21.4. The observer effect

In physics, the observer effect suggests that the mere act of observing a phenomenon changes it.[147] The same applies to nutrition. The act of tracking creates a pause between desire and action. When you know you have to pull out your phone, search for a food and log it before you eat it, you disrupt the automatic, mindless hand-to-mouth habit that drives so much overeating.

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[147] Griffiths, D. J., & Schroeter, D. F. (2018). *Introduction to quantum mechanics* (3rd ed.). Cambridge University Press. https://doi.org/10.1017/9781316995433

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This pause creates a moment of mindfulness. You have to ask yourself: 'is this worth logging?' 'Do I really want this or am I just bored?' 'If I eat this now, then what will I have to sacrifice from my dinner later?' This cognitive hurdle may inhibit impulsive behaviour. It can force you to take ownership of the decision. You can still choose to eat the biscuit, but it becomes a conscious, deliberate choice.

Further, objective data provide a constant, impartial record of adherence. It is easy to lie to yourself or your coach about how well you stuck to your diet. Conversely, a digital log of quantifiable entries is an objective record that is difficult to misinterpret or rationalize. If the scale is not moving, then you can look at your logs. Were you actually in a deficit? Did you 'forget' to log the weekends? Did you eyeball portion sizes instead of weighing them? The data will expose the bottleneck preventing progress, allowing you to isolate and fix it.

21.5. Using digital tracking apps

In the past, calorie counting meant carrying a notebook and a reference book of food values. It was slow, cumbersome and socially awkward. Today, apps have removed the hassle. They possess vast, user-generated databases containing

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millions of foods, from raw ingredients to specific restaurant dishes.

Logging your food takes almost no effort. You place your bowl on a digital food scale, an essential companion to the app. You zero the scale. You pour your oats. You scan the barcode on the box with your phone's camera. The app recognizes the food and prompts you for the weight. You type in 50 grams. The app calculates the calories, protein, carbs and fats, subtracting them from your daily totals. The entire process takes seconds.

This precision is invaluable because it corrects our tendency to underestimate what we eat. What looks like a single serving of peanut butter to the naked eye is often three servings. An avocado can vary in calorie count by hundreds depending on its actual weight. Weighing and logging calibrates your eyes. You learn what 100 grams of steak actually look like. You learn what a real tablespoon of oil looks like. This education is cumulative. You are training your brain to recognize true portion sizes, a skill that stays with you even when you are not using the app.

21.6. How to do it

To begin the process of tracking, you need the right tools. The primary tool is a digital food tracking application. While

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there are many options available—e.g., FatSecret, MyFitnessPal, Cronometer—the specific software matters less than your consistency in using it.

Your second essential tool is a digital kitchen scale. This is not optional. Volumetric measurements—cups, tablespoons and handfuls—are notoriously inaccurate. A cup of packed oats contains a lot more energy than a cup of loose oats, yet a measuring cup cannot distinguish between the two. A scale measures mass, which is the only reliable proxy for energy content in a kitchen setting. Place your scale on a flat, hard surface, and get into the habit of weighing everything that goes into your mouth. This may feel tedious at first, but it quickly becomes a seamless part of the cooking process. You place your plate on the scale, zero it out, add your protein, note the weight, zero it again, add your carbohydrates and so on.

The golden rule of accurate tracking is to weigh your food raw whenever possible. Nutritional labels on packaging almost always refer to the food in its uncooked state. This distinction is key because the water content of food changes drastically during cooking. Meat loses water and shrinks, meaning that 100 grams of cooked steak are a lot more calorically dense than 100 grams of raw steak. Conversely, grains like rice and pasta absorb water and expand, meaning that 100 grams of cooked rice are far less energy-dense than

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100 grams of raw rice. If you weigh your chicken cooked but log it using the raw entry in your app, then you will inadvertently consume far more calories than you think. If you weigh your rice cooked but log it as raw, then you will inadvertently consume far fewer calories than you think. To avoid this, weigh your ingredients before they hit the pan or the pot and log the raw or uncooked entry in your database.

It is a good idea to plan your daily intake in your app each morning, or at the very least, log your meals as they occur. You should never rely on retrospective tracking, i.e., attempting to recall and log everything you ate at the end of the day or, worse, the following morning. If you wait until 8:00 PM to tally your intake, then you might discover that you exhausted your calorie allowance by mid-afternoon, or that you are fifty grams short of your protein target with almost no calories left to spare.

Unless you carry a food scale at all times—like me—there will inevitably be times when you cannot weigh your food, such as when dining out or attending social events. In these scenarios, you have to estimate your intake. If you are eating at a chain restaurant, then search the app for the specific menu item, as these establishments are legally required to publish nutritional information. If you are at a local restaurant, then find a comparable entry from a popular chain or a generic database entry that seems robust and err

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on the side of a higher calorie count to be safe. For example, if you eat a burger at a local pub, then logging a Five Guys Cheeseburger is a safer bet than a generic hamburger entry, which might reference a small, low-calorie patty. When you cannot find a match, estimate the components separately: log the bun, the estimated amount of beef, the slice of cheese and always add a tablespoon or two of oil to account for the cooking method. The goal here is damage control.

Finally, effective tracking requires a feedback loop. The data you input into the app must be correlated with your body weight. Weigh yourself every morning after using the toilet and before eating or drinking, then take the average of your weight across the week. If your average weight is not dropping at your desired rate, then your calorie target is too high. To fix this, you have to adjust your intake down by a modest amount and observe the trend for another two weeks (a practice detailed in chapter 27). By correlating these two datasets—your food intake and your body weight—you can make precise adjustments as you go.

21.7. Tracking hacks

While tracking is simple on paper, the messy realities of daily life can disrupt the process. You will not always be preparing single-serving meals to eat alone. You will share dinners with partners, cook large batches of food for the week and

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encounter ingredients that seem designed to defy a digital scale. Fortunately, there are a few tricks that you can employ when faced with these complexities.

21.7.1. Pasta and rice

Tracking macros while sharing staple carbohydrates like pasta or rice can feel frustrating since you must always log the raw weight. Fortunately, cooking a separate pot for yourself is unnecessary. By establishing your raw-to-cooked ratio using the vessel subtraction method, you can easily calculate your exact portion from a shared batch.

Here is how to do it:

1. Start by placing your empty pot, pan or rice cooker insert on the scale before cooking and write down its weight so that you do not have to transfer hot food later.
2. Measure the total dry weight of the rice or pasta before adding it to the pot and note this raw number.
3. Cook the batch as you normally would until the water is fully absorbed or drained.
4. Place the entire pot containing the cooked food back on the scale once it is done and subtract the empty vessel's weight from this final total number to reveal the net weight of your cooked batch.

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5. Determine your portion size and log the corresponding raw weight using either simple fractions or a cooking multiplier. If you know that you want half of the batch, then simply dish out half of the total cooked weight and log half of the original raw weight in your app. If you prefer to scoop a random amount onto your plate, then divide your total net cooked weight by your total raw weight to find your multiplier. For example, if 200 g of raw food yield 500 g cooked, then your multiplier is 2.5. You can then weigh your plated portion, divide it by that multiplier and log the raw equivalent.

21.7.2. Stews, curries and casseroles

Batch-cooking complex meals like stews, curries and casseroles can be a tracking challenge, as dividing a large pot into perfectly equal portions by eye often leads to wild inaccuracies. Fortunately, you can eliminate this guesswork by using the gram-as-serving method within your tracking app's recipe builder.

Here is how to do it:

1. Place your large, empty cooking pot or baking dish on the scale before turning on the heat and write down its exact weight.

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2. Create a new recipe in your tracking app, weighing and logging all of the raw ingredients into the app's recipe builder as you add them to the pot.
3. Cook the meal as you normally would, allowing it to simmer, bake or reduce.
4. Place the entire heavy pot containing the finished food back on the scale and subtract the empty pot's weight that you recorded earlier to find out the net weight of the cooked dish.
5. Input that total net weight as the number of servings when finalizing the recipe in your app. For example, if your entire cooked stew weighs 2,400 grams, then tell the app that the recipe yields 2,400 servings.
6. Serve your meal by placing your bowl on the scale, zeroing it out and ladling in your food.
7. Log the weight of the food in your bowl as the number of servings consumed. If your portion weighs 450 grams, then you simply log 450 servings of that recipe.

21.7.3. Peanut butter, tahini and cooking oils

Measuring sticky, energy-dense or liquid foods like peanut butter, tahini and cooking oils conventionally is a messy process that often leaves unlogged calories clinging to your spoon. You can easily avoid this frustration and ensure perfect accuracy by using the negative scale method.

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Here is how to do it:

1. Place the entire, open jar or bottle onto your digital food scale.
2. Press the zero or tare button so that the digital display reads zero.
3. Scoop out your desired amount with a utensil or pour the liquid directly from the bottle into your pan or onto your meal.
4. Place the container back onto the scale.
5. Check the negative value now showing on the display, which represents the amount of food that has left the jar.
6. Log that number into your tracking app while ignoring the negative sign (meaning a reading of -32 g is simply entered as 32 g of food).

21.8. Mitigating tracking fatigue through dietary repetition

A final tracking hack is to do with the structure of your diet itself. While modern food culture often champions endless dietary variety, this constant novelty can disrupt tracking efficiency. If you attempt to construct twenty-one entirely unique meals every week, then you are forcing yourself to search for new database entries, weigh unfamiliar ingredients and build complex digital recipes three times a day. This can

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lead to tracking fatigue and burnout. The most successful trackers often mitigate this by embracing repetition. Eating generally the same foods day to day reduces the administrative burden of logging.[148] You can create a core rotation of just a few breakfasts, lunches and dinners that you know already fit your macronutrient targets perfectly. Once you have weighed and logged your standard morning oats or your go-to tofu stir-fry, you can save it as a complete meal in your tracking app. From that point forward, logging your food is a single tap of a button. You can still enjoy variety, but by confining it to just one meal a day—perhaps dinner—while keeping your earlier meals locked in and predictable, you banish decision fatigue and save your mental energy for the rest of your life.

21.9. Breaking the obsession

The potential downsides of tracking require careful consideration. For some, the numbers can become a source of anxiety. If you fall into this category, then remember that

[148] It is also worth noting that nutritional labels carry inherent margins of error (Urban et al., 2010). This means that if your meals constantly change, then your daily caloric inaccuracies will fluctuate unpredictably. Conversely, by eating the same core foods, you ensure that even if your tracking is inaccurate, it is at least *consistently* inaccurate. A consistent error is manageable because if the scale stalls, then you can reliably drop your intake to resume the deficit. However, this particular consideration matters more for physique competitors—for whom accuracy is paramount—than for the general population, hence its placement in a footnote.

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the biological difference between hitting your calorie target exactly and being off by fifty calories is miniscule. The body operates on averages over time.

You can treat tracking as a temporary educational phase. The ultimate goal for most people is to track for a period—perhaps three to six months—to download the data into your brain. You are creating an internal database. After months of weighing your breakfast, you will know roughly what an appropriate portion looks like. You will know intuitively which foods are high in protein and which are calorie bombs.

Once this nutritional intuition is built—an intuition based on data—you can transition away from strict tracking. You can move to more relaxed methods, perhaps only tracking protein or only tracking on days where you feel off-track. But you cannot effectively move to intuitive eating until you have educated your intuition. You cannot improvise on the piano until you have mastered the scales. Tracking is the practice of those scales.

21.10. Key takeaways

- Tracking calories and macronutrients by weighing and logging your food is an indispensable practice. It bypasses flawed human intuition, making the dieting

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process objective and providing you with actionable data.

- A digital kitchen scale is mandatory, and all foods must be weighed in their raw/uncooked state to ensure accuracy and avoid error from water loss or absorption during cooking.
- When weighing is impossible, pivot to estimation by finding comparable menu items or estimating components separately, always erring on the side of a higher calorie count for safety.
- Prevent tracking fatigue and burnout by embracing dietary repetition and saving standardized, repeated meals in the app.

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Chapter 22. Managing hunger

Hunger is a primary reason that diets fail. To succeed in fat loss, you have to stop viewing hunger as a threat and recognize it as a predictable biological response that requires management. You cannot eliminate the sensation entirely during a fat-loss phase, but you can reduce its intensity. This chapter focuses on the strategies used to lower the severity of hunger signals to a level that does not compromise your adherence.

22.1. Ghrelin, leptin and the regulation of hunger

Hunger is a complex interaction of hormonal signals and psychological triggers. The primary initiator of hunger is the stomach itself. When your stomach is empty, it secretes a hormone called ghrelin, which signals the brain to seek out calories.[149] It travels through the bloodstream to the hypothalamus in the brain, targeting the areas that control appetite and reward. Its message is simple and urgent: find food now.

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[149] Wren, A. M., Seal, L. J., Cohen, M. A., Brynes, A. E., Frost, G. S., Murphy, K. G., Todd, J. F., Ghatei, M. A., & Bloom, S. R. (2001). Ghrelin enhances appetite and increases food intake in humans. *The Journal of Clinical Endocrinology & Metabolism*, *86*(12), 5992–5995. https://doi.org/10.1210/jcem.86.12.8111

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Interestingly, ghrelin levels tend to rise and fall in a rhythmic pattern, often coinciding with your habitual meal times.[150] This implies that your body learns when to expect food and prepares the digestive system by ramping up hunger signals in anticipation. Therefore, a consistent eating schedule minimizes random spikes in appetite and ensures that your most acute hunger aligns with your planned meals. This also explains why restrictive protocols like One Meal A Day (OMAD) eventually become sustainable. While going from three meals and three snacks down to just one meal is initially uncomfortable, your ghrelin rhythm is trainable. Your body will eventually adapt to the new meal frequency, concentrating your appetite into the hours preceding that one meal.

Counteracting ghrelin is leptin, the hormone of satiety. Produced by your fat cells, leptin signals the body's available energy reserves. When your fat stores are full, leptin levels are high, signalling the brain that energy reserves are sufficient and you can afford to eat less. However, as you lose body fat—the very thing you are trying to achieve—your leptin levels drop.[151] The brain interprets this drop as a state

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[150] Cummings, D. E., Purnell, J. Q., Frayo, R. S., Schmidova, K., Wisse, B. E., & Weigle, D. S. (2001). A preprandial rise in plasma ghrelin levels suggests a role in meal initiation in humans. *Diabetes*, *50*(8), 1714–1719. https://doi.org/10.2337/diabetes.50.8.1714

[151] MacLean, P. S., Bergouignan, A., Cornier, M. A., & Jackman, M. R. (2011). Biology's response to dieting: The impetus for weight regain.

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of energy scarcity, responding by increasing hunger and decreasing your metabolic rate to conserve energy.

While we cannot alter these physiological parameters, we can manage them. The most powerful physical intervention we have against the ghrelin-leptin axis is the manipulation of food volume, a strategy so critical that it requires its own dedicated breakdown in chapter 23.

22.2. Protein and satiety

Alongside volume, protein is a primary contributor to satiety. Of the three macronutrients—protein, carbohydrates and fats—protein is the most satiating.[152] When you consume protein, it triggers the release of satiety hormones in the gut, such as peptide YY and GLP-1, which effectively tell the brain to put down the fork.[153]

American Journal of Physiology-Regulatory, Integrative and Comparative Physiology, *301*(3), R581–R600. https://doi.org/10.1152/ajpregu.00755.2010

[152] Lejeune, M. P. G. M., Westerterp, K. R., Adam, T. C. M., Luscombe-Marsh, N. D., & Westerterp-Plantenga, M. S. (2006). Ghrelin and glucagon-like peptide 1 concentrations, 24-h satiety, and energy and substrate metabolism during a high-protein diet and measured in a respiration chamber. *The American Journal of Clinical Nutrition*, *83*(1), 89–94. https://doi.org/10.1093/ajcn/83.1.89

[153] Batterham, R. L., Heffron, H., Kapoor, S., Chivers, J. E., Chandarana, K., Herzog, H., Le Roux, C. W., Thomas, E. L., Bell, J. D., & Withers, D. J. (2006). Critical role for peptide YY in protein-mediated satiation and body-weight regulation. *Cell Metabolism*, *4*(3), 223–233. https://doi.org/10.1016/j.cmet.2006.08.001; Leidy, H. J., Clifton, P. M.,

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A breakfast high in sugary cereal or refined toast is rapidly digested, leading to a spike in blood sugar followed by a crash that may leave you ravenous by mid-morning. In contrast, a breakfast centred on egg whites or non-fat yoghurt provides a steady release of energy and keeps hunger at bay for hours. Ensuring a high protein intake at every meal reduces appetite throughout the day. However, while protein and volume can manage the physical signals from the gut, the stomach is not the only source of hunger.

22.3. Homeostatic hunger and hedonic hunger

The brain plays an equally potent role. We can distinguish between homeostatic hunger and hedonic hunger. Homeostatic hunger is the physical need for energy; the rumbling stomach, the lightheadedness, the genuine physiological drive that we just discussed. Hedonic hunger is the desire to eat for pleasure. This is the type of hunger that strikes when you are stuffed from dinner but suddenly have room for dessert. The modern food environment caters to hedonic hunger. Hyper-palatable foods—those perfectly

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Astrup, A., Wycherley, T. P., Westerterp-Plantenga, M. S., Luscombe-Marsh, N. D., Woods, S. C., & Mattes, R. D. (2015). The role of protein in weight loss and maintenance. The American Journal of Clinical Nutrition, 101(6), 1320S–1329S. https://doi.org/10.3945/ajcn.114.084038

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crafted combinations of sugar, salt, fat and textures—bypass our natural satiety signals. You can eat thousands of calories of potato chips or ice cream without ever feeling truly full because not only are these foods very tasty, but they are low in volume, devoid of protein and fibre and easy to eat quickly.

22.4. Environmental design

Managing hedonic hunger requires a different toolkit than managing physical hunger. It requires mindfulness and environmental design. The most effective way to manage hedonic hunger is to remove the visual and physical cues that trigger it. If you have a bag of biscuits on the counter, then your brain will constantly expend mental energy resisting them. This is often referred to as decision fatigue. Eventually, your willpower may wear down, leading you to eat the biscuits. However, if the biscuits are not in the house, then the decision is made for you. You cannot eat what is not there. If you curate your environment to be free of trigger foods, then you reduce the frequency of hedonic cravings. When you do choose to indulge, it should be an intentional act, e.g., going out for ice cream rather than mindlessly eating it straight from the tub while watching television.

The speed of your eating also influences how your brain processes satiety. We live in a culture of rushing, often

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inhaling our meals while distracted by screens or work. The problem is that the satiety signals from the gut to the brain appear to operate on a delay.[154] If you consume an entire meal in five minutes, then you can easily overeat before your brain has had a chance to register that you are full. Slowing down is a valuable element of hunger management. This involves chewing food thoroughly, putting the cutlery down between bites, limiting the size of mouthful in each fork-load, eating with your non-dominant hand and sipping water throughout the meal. It forces you to extend the duration of the feeding window, allowing the hormonal signals to catch up with the physical intake.

22.5. Hydration and hunger

We seem to mismanage our hunger and thirst cues often. McKiernan and colleagues indicated that people respond appropriately to their hunger and thirst cues (e.g., by drinking water when thirsty but not hungry) only a fraction of the time. The majority of the time, they responded inappropriately, frequently eating when they were experiencing thirst rather than hunger.[155]

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[154] Andrade, A. M., Greene, G. W., & Melanson, K. J. (2008). Eating slowly led to decreases in energy intake within meals in healthy women. *Journal of the American Dietetic Association*, *108*(7), 1186–1191. https://doi.org/10.1016/j.jada.2008.04.026

[155] McKiernan, F., Houchins, J. A., & Mattes, R. D. (2008). Relationships between human thirst, hunger, drinking, and feeding. *Physiology & Behavior*, *94*(5), 700–708. https://doi.org/10.1016/j.physbeh.2008.04.007

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When a craving arises between meals, it is a good idea to drink a large glass of water and wait for ten minutes. The transient gastric stretch and the hydration may be enough to make a passing craving dissipate. If not, then you are likely experiencing genuine hunger.

22.6. The impact of sleep and stress on hunger

As we will discuss in chapter 25, sleep is one of the most influential non-dietary factors in weight management. When you are sleep-deprived, your hormonal balance is thrown into chaos. Cortisol, the stress hormone, rises. Ghrelin spikes and leptin plummets. Prioritizing seven to nine hours of quality sleep restores the balance of your appetite hormones and gives you the executive function required to make better food choices the next day.

Stress management works in tandem with sleep. Chronic stress leads to chronically elevated cortisol levels. Cortisol may increase cravings for comfort foods.[156] We often use food as a soothing mechanism because highly palatable meals stimulate the release of endogenous opioids, which

[156] Tomiyama, A. J. (2019). Stress and obesity. *Annual Review of Psychology*, *70*(1), 703–718. https://doi.org/10.1146/annurev-psych-010418-102936

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help to dampen the body's stress response.[157] However, the psychological relief from eating is fleeting and often leads to a cycle of guilt and further stress.[158] Finding non-food coping mechanisms for stress, whether it be walking, meditation, journalling or talking to a friend, breaks the link between emotional soothing and calorie intake.

22.7. Surfing the urge

Even with a high-volume, high-protein diet and adequate sleep, there will be moments when you are simply hungry. This is where the mindset shift must occur. In a culture that flatters and serves instant gratification, we have pathologized hunger. We treat the slightest pang of emptiness as an emergency that immediately has to be fixed. We catastrophize the sensation the moment we enter a calorie deficit, forgetting that we routinely experience periods of hunger between meals even when eating at maintenance calories.

Mild hunger is just a sensation. While dieting, you can think of hunger as the feeling of fat loss occurring. It is helpful to

[157] Adam, T. C., & Epel, E. S. (2007). Stress, eating and the reward system. *Physiology & Behavior*, *91*(4), 449–458. https://doi.org/10.1016/j.physbeh.2007.04.011

[158] Haedt-Matt, A. A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: A meta-analysis of studies using ecological momentary assessment. *Psychological Bulletin*, *137*(4), 660–681. https://doi.org/10.1037/a0023660

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learn to surf the urge. When a wave of hunger hits, rather than bracing against it or immediately succumbing to it, we need to recognize it as a partner rather than an enemy. Observe it with curiosity rather than panic. 'I am feeling hunger right now because I am in a deficit. This is normal. This is good. It will pass'. Most hunger pangs are transient; they rise, reach a crest and then fall.[159] If you can sit with the discomfort for fifteen minutes, distract yourself with a task or drink some water, then you will often find that the wave recedes on its own.

The distinction between homeostatic hunger and hedonic hunger also matters here. Homeostatic hunger is gradual, open to different food options and stops when you are full. Hedonic hunger—or a craving—is sudden, specific to a certain texture or taste and urgent. A useful heuristic is the broccoli test. If you feel hungry, then ask yourself: 'would I eat a plate of steamed broccoli and plain chicken breast right now?' If the answer is yes, then you are physically hungry. If the answer is 'no, but I would eat a slice of pizza', then you are simply experiencing a craving or boredom. Identifying this difference allows you to categorize the discomfort: you endure homeostatic hunger as the necessary cost of a deficit,

[159] Cannon, W. B., & Washburn, A. L. (1912). An explanation of hunger. *American Journal of Physiology*, *29*(4), 441–454. https://doi.org/10.1152/ajplegacy.1912.29.5.441

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and you dismiss hedonic hunger as a distraction, yielding to neither.

22.8. The impact of meal frequency on hunger

We know by now that meal frequency does not impact fat loss or muscle growth, provided that calories and protein are equated. But how does it impact the management of hunger?

Modern research suggests that eating three meals a day versus six improves feelings of fullness and reduces overall appetite.[160] However, dropping from three meals down to two may decrease satiety, even with equated calories.[161] It would therefore seem that three meals per day—with no snacks—are a solid starting point.

A lower meal frequency may help you manage hunger during your most vulnerable windows. One approach is to backload

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[160] Leidy, H. J., Armstrong, C. L. H., Tang, M., Mattes, R. D., & Campbell, W. W. (2010). The influence of higher protein intake and greater eating frequency on appetite control in overweight and obese men. *Obesity*, *18*(9), 1725–1732. https://doi.org/10.1038/oby.2010.45; Ohkawara, K., Cornier, M.-A., Kohrt, W. M., & Melanson, E. L. (2013). Effects of increased meal frequency on fat oxidation and perceived hunger. *Obesity*, *21*(2), 336–343. https://doi.org/10.1002/oby.20032

[161] Smeets, A. J., & Westerterp-Plantenga, M. S. (2008). Acute effects on metabolism and appetite profile of one meal difference in the lower range of meal frequency. British Journal of Nutrition, 99(6), 1316–1321. https://doi.org/10.1017/S0007114507877646

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calories: eating lightly during the day—perhaps even relying on just black coffee—to save a substantial calorie budget for the evening. For many, this is highly effective, as it aligns the largest meal with social relaxation and prevents the feeling of deprivation before sleep.

However, for some, this strategy carries a risk. The accumulated hunger of the day can trigger a compensatory response, precipitating a catastrophic evening binge where the pantry is raided and the deficit is erased in minutes. For these people, a superior strategy is to distribute protein and fibre evenly throughout the day, ensuring a consistent regulation of satiety and blood sugar.

Meal frequency is ultimately a matter of personal calibration. Some—like me—do well with the feast-and-famine rhythm of intermittent fasting; others find that fasting dissolves their inhibition. If you are drawn to the idea of fewer meals but struggle with the initial hunger, then remember that, as stated before, ghrelin is trainable. Your body releases this hunger hormone based on your habitual eating times, meaning that you will eventually adjust to a lower meal frequency once you establish the routine.

'But what about performance?', one might ask. It is common to fear that delaying or skipping a meal will crash your energy levels or ruin your workout. However, the human

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body is remarkably resilient in the absence of food. In subjects who went entirely without food for 84 hours, isometric strength, anaerobic capacity and aerobic endurance were largely unaffected.[162] If physical performance on a 3.5-day fast is fine, then pushing your first meal back by a few hours is unlikely to impair your training.

Ultimately, the best meal frequency is simply the one that keeps you out of the danger zone of voracious, uncontrollable hunger.

22.9. Palatability and flavour fatigue

Let us also address the concept of palatability and flavour fatigue. Simple, whole foods are naturally self-limiting. It is difficult to overeat boiled potatoes or plain apples. It is very easy to overeat French fries or apple pie. This is because modern processing depletes water and fibre while concentrating sugar and fat, but also because of flavour complexity. When a meal has a high variety of flavours and textures, we tend to eat more.[163] This is known as the buffet effect. To manage hunger, simplifying your meals can be

[162] Knapik, J. J., Jones, B. H., Meredith, C., & Evans, W. J. (1987). Influence of a 3.5 day fast on physical performance. *European Journal of Applied Physiology and Occupational Physiology*, *56*(4), 428–432. https://doi.org/10.1007/BF00417770

[163] Rolls, B. J., Rowe, E. A., Rolls, E. T., Kingston, B., & Megson, A. (1981). Variety in a meal enhances food intake in man. *Physiology & Behavior*, *26*(2), 215–221. https://doi.org/10.1016/0031-9384(81)90014-7

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effective. If your meals are nutritious but somewhat repetitive and predictable, then the reward value decreases. This does not mean that your food should be bland, but reducing the hyper-stimulation of the palate helps to reset your hunger cues to align with your actual energy needs.

22.10. The GLP-1 revolution

A transformative component of the modern hunger management toolkit is the use of GLP-1 receptor agonists, e.g., semaglutide (Ozempic/Wegovy). These drugs function by mimicking the action of a naturally occurring hormone that regulates satiety, intervening in the communication loop between the gut and the brain. These medications enhance the physical feeling of fullness and quiet the importunate, intrusive thoughts about food known as food noise. In doing so, they can resolve the conflict between your body's drive for calories and your conscious desire to adhere to a calorie deficit.

However, these medications should be used as an adjunct to—and never a replacement for—the nutritional and behavioural strategies outlined in this book. For one, the clinical data suggest that the active weight-loss effects of these drugs are not infinite. As observed in the STEP 1 trial, which tracked patients on semaglutide over 68 weeks, the initial rapid drop in weight gradually decelerates as the body

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adapts. On average, patients hit a hard plateau around week 60.[164] GLP-1 agonists merely suppress your appetite; they do not automatically teach you how to eat properly or how to continue progressing once you plateau.

If you rely solely on pharmacology without addressing the underlying structure of your diet, then you are building on a fragile foundation. Using these drugs as a crutch poses risks. When your appetite is chemically blunted, it becomes dangerously easy to undereat protein, or to coast by on tiny portions of hyper-palatable, nutrient-poor foods. Together with being sedentary, this is why many who rely solely on the medication simply shrink into smaller, softer versions of themselves, rather than building a lean and muscular physique. Worse still, if you ever choose to taper off the medication, then that hunger suppression will be lifted. If you have not used your time on the drug to master the underlying fat loss skills, then the returning food noise and hunger will almost inevitably lead to rapid weight regain.

Conversely, when you pair GLP-1 agonists with the strategies detailed in this book, you create a powerful synergy. The

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[164] Wilding, J. P. H., Batterham, R. L., Calanna, S., Davies, M., Van Gaal, L. F., Lingvay, I., McGowan, B. M., Rosenstock, J., Tran, M. T. D., Wadden, T. A., Wharton, S., Yokote, K., Zeuthen, N., Kushner, R. F., & STEP 1 Study Group. (2021). Once-weekly semaglutide in adults with overweight or obesity. *The New England Journal of Medicine*, *384*(11), 989–1002. https://doi.org/10.1056/NEJMoa2032183

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drug, by reducing food noise, makes it easier to nail the fundamentals: prioritizing lean proteins, stretching your stomach with fibrous vegetables, accurately tracking your food intake and engaging in regular resistance training. Pharmacology can create a favourable environment for fat loss, but it is the proper execution of your daily dietary habits and resistance training that will actually do the work, improve your health and physique and sustain the result for the rest of your life.

22.11. Key takeaways

- Hunger is inevitable on a fat-loss diet but can be managed and reduced.
- Hunger should not be viewed as a foe; instead, while dieting, it should be viewed as a signal that you are burning fat.
- Your ghrelin rhythm is trainable; eat at consistent times to align your hunger with your planned meals.
- Protein is the most satiating macronutrient; prioritizing it prolongs fullness by slowing digestion and triggers gut hormones which signal satiety (GLP-1 and peptide YY).
- Use the broccoli test ('would I eat plain broccoli right now?') to distinguish true physiological hunger from a craving.

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- Manage hedonic hunger by removing trigger foods from your immediate environment to eliminate visual cues and reduce decision fatigue.
- Slow down the consumption of meals (e.g., by chewing thoroughly) so that you can register fullness before overeating.
- The brain often confuses thirst for hunger; drinking water between meals can dissipate false hunger pangs.
- Meal volume is a helpful hunger management tool as it stretches the stomach to signal fullness.
- Sleep deprivation and chronic stress are highly destabilizing, as they raise cortisol and ghrelin while lowering leptin, making 7–9 hours of quality sleep and stress management critical for hunger management.
- Three meals a day (with no snacks) are a solid starting point for hunger management, but the best meal frequency is ultimately a matter of personal calibration.
- Learn to surf the urge by recognizing hunger pangs as transient.

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Chapter 23. Mastering the art of volume eating

Volume eating is the practice of consuming large quantities of food to achieve satiety while simultaneously lowering overall calorie intake. Through volume eating, you do not need to feel hungry and deprived; instead, you can create a lifestyle where you eat more to weigh less. This chapter explores the physiology, the psychology and the practical application of this helpful culinary ruse.

23.1. The physiology of fullness

As we established in the previous chapter, hormones like ghrelin and leptin govern your hunger drive. However, the immediate sensation of having had enough to eat at any given meal is largely mechanical.

Deep within the lining of your stomach are mechanoreceptors, specialized nerve endings that detect stretching. When you consume a meal, the stomach expands. As the gastric wall stretches, these receptors fire signals to the brain via the vagus nerve, indicating that the organ is filling up.[165]

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[165] Page, A. J. (2021). Gastrointestinal vagal afferents and food intake: Relevance of circadian rhythms. *Nutrients*, *13*, 844. https://doi.org/10.3390/nu13030844

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The loophole that volume eating exploits is that the stomach is not a calorimeter. It cannot detect the difference between 500 calories of oil and 500 calories of watermelon; it only registers the volume and weight of the mass pressing against its walls.[166] If you rely on calorically dense foods—processed snacks, oils, heavy creams and refined sugars—then you can consume thousands of calories before your stomach physically stretches enough to trigger those mechanoreceptors. Conversely, by filling your plate with foods that have a low calorie density, you can trigger those stretch receptors and achieve that reassuring feeling of fullness on a fraction of the energy intake.

23.2. Calorie density

The core scientific principle behind volume eating is calorie density, defined as the number of calories in a given weight or physical volume of food, usually expressed as calories per gram.

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[166] Cummings, D. E., & Overduin, J. (2007). Gastrointestinal regulation of food intake. *Journal of Clinical Investigation*, *117*, 13–23. https://doi.org/10.1172/jci30227; Rolls, B. J., & Roe, L. S. (2002). Effect of the volume of liquid food infused intragastrically on satiety in women. *Physiology & Behavior*, *76*, 623–631. https://doi.org/10.1016/s0031-9384(02)00801-6

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Foods exist on a spectrum of density. On the far right of the spectrum, we have fats and oils. Pure oil is the most calorically dense food on the planet, containing roughly 9,000 calories per kilogram (≈ 4,000 calories per pound). Just a few tablespoons can equal the caloric worth of an entire meal yet occupy almost no space in the stomach. Chocolate, nuts, heavy creams and hard cheeses also reside on this end of the spectrum.

On the far left of the spectrum are non-starchy vegetables. A kilogram of spinach contains roughly 230 calories. To consume the same caloric energy found in a single tablespoon of oil, you would need to eat a quantity of spinach that would physically spill over a large mixing bowl. In between these extremes are starches like potatoes, rice and oats, followed by lean proteins.

Volume eating is essentially the practice of shifting the majority of your dietary intake toward the left side of this spectrum. It relies on foods that are high in water, fibre and air. Water adds weight and volume to food but contains zero calories. Fibre adds bulk and slows digestion but passes through the body largely unabsorbed. Air expands food physically—like in popcorn, whipped egg whites or protein fluff—stretching the stomach without adding any calories. Foods naturally high in water, fibre and/or trapped air—vegetables, fruits, cooked whole grains, legumes and

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aerated foods—allow you to construct meals that are physically mountainous but energetically moderate.

Consider the visual difference between these options. Imagine a standard fast-food meal: a double cheeseburger and a serve of medium fries. It is a compact, dense package of energy, likely exceeding 1,200 calories. It is eaten quickly and because it lacks volume, fibre and air, it leaves the stomach rapidly, often leading to hunger returning within two hours. Now, imagine a volume-based meal of equal calories. It might look like a capacious mixing bowl filled with greens, cucumbers, tomatoes and capsicums, topped with a large grilled chicken breast, a serving of boiled potatoes, a side of fruit and perhaps even a yoghurt-based dessert. The volume eater may struggle to finish this alternative meal, despite the calorie count being identical. This is the power of volume eating.

23.3. The satiety index

In 1995, researchers developed the satiety index, a quantifiable metric designed to measure the fullness induced by different foods. The methodology involved feeding subjects isocaloric 240-calorie portions of 38 common foods and tracking their subjective hunger over a two-hour period, using white bread as the baseline index score of 100%.

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The findings reinforce the principles of volume eating. Energy-dense foods with high fat and sugar content, such as croissants and cakes, scored the lowest. Conversely, the plain boiled potato scored the highest of all the tested foods at 323%, yielding a satiety response more than three times greater than the white bread baseline.

The 38 tested foods, ranked by their physiological satiety response relative to the white bread baseline (100%), are as follows:

- Potatoes, boiled 323%
- Ling fish 225%
- Porridge/oatmeal 209%
- Oranges 202%
- Apples 197%
- Brown pasta 188%
- Beef 176%
- Baked beans 168%
- Grapes 162%
- Whole meal bread 157%
- Grain bread 154%
- Popcorn 154%
- All-Bran 151%
- Eggs 150%
- Cheese 146%
- White rice 138%

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- Lentils 133%
- Brown Rice 132%
- Honeysmacks 132%
- Crackers 127%
- Cookies 120%
- White pasta 119%
- Bananas 118%
- Jellybeans 118%
- Cornflakes 118%
- Special K 116%
- French fries 116%
- Sustain 112%
- White bread 100%
- Muesli 100%
- Ice cream 96%
- Crisps 91%
- Yoghurt 88%
- Peanuts 84%
- Mars candy bar 70%
- Doughnuts 68%
- Cake 65%
- Croissant 47%[167]

[167] Holt, S. H. A., Brand Miller, J. C., Petocz, P., & Farmakalidis, E. (1995). A satiety index of common foods. *European Journal of Clinical Nutrition*, *49*(9), 675–690.

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As you can see, the 1995 study only evaluated a list of 38 foods, focusing primarily on common starches, proteins, bakery products and fruits. It omitted ultra-low-calorie-density vegetables such as broccoli and cauliflower, high-volume liquid bases such as clear broths and artificially volumized, highly processed frankenfoods such as aerated protein fluff and sugar-free jelly.

I imagine that these foods were omitted because their extreme volume would have made them incompatible with the study design. For example, to reach the required 240-calorie testing threshold, a subject would have to consume approximately 700 grams of raw broccoli in a single sitting. While they are unrecorded on the official index, these fibrous, water-dense vegetables would theoretically generate a satiety response vastly exceeding that of the boiled potato due to severe gastric distension.

23.4. Do not drink your calories

An oft-repeated maxim in dieting is ‘do not drink your calories’. This is largely sound advice, and the principles of volume eating explain why.

When you eat a solid, high-volume meal, it physically stretches the stomach, sending signals to your brain that you have eaten. Liquids, on the other hand, empty from the

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stomach rapidly and do not exert the same pressure.[168] Further, the very act of chewing (mastication) triggers satiety signals in the brain, a step entirely bypassed when you drink a beverage.[169]

Consider the example of orange juice. A standard 250 ml (8oz) glass of orange juice contains roughly 110 calories. You can down that glass in five seconds and feel no fuller than before you started. To consume those same 110 calories from whole oranges, you would need to eat nearly two entire medium oranges. The whole fruit provides physical bulk and fibre that slows digestion and occupies space in your gut.

The same principle applies to smoothies, milkshakes, full-sugar sodas and heavy coffees. A 400-calorie blended frappuccino offers zero chewing time and minimal stomach stretch, yet it consumes a large chunk of your daily energy budget.

What about protein shakes? Because protein is the most satiating macronutrient, a standard whey or casein shake is

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[168] de Graaf, C. (2011). Why liquid energy results in overconsumption. *Proceedings of the Nutrition Society*, *70*, 162–170. https://doi.org/10.1017/s0029665111000012

[169] Miquel-Kergoat, S., Azais-Braesco, V., Burton-Freeman, B., & Hetherington, M. M. (2015). Effects of chewing on appetite, food intake and gut hormones: A systematic review and meta-analysis. *Physiology & Behavior*, *151*, 88–96. https://doi.org/10.1016/j.physbeh.2015.07.017

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nowhere near as detrimental to your hunger levels as a glass of juice or soda. However, if you are deep into a fat-loss phase and struggling with hunger, then you are likely better off chewing your protein than drinking it. You can use those same protein powders to create high-volume frankenfoods (e.g., protein fluff, see §31.2), which are much more satiating than shakes.

It is better to stick to water, black coffee, tea and artificially sweetened drinks, and save your calorie budget for food that you can chew.

23.5. The psychological impact of meal volume

While the physical mechanics are compelling, the psychological benefits of volume eating are perhaps even more remarkable for fat loss. Dieting often induces a scarcity mindset. When you look at a tiny portion of food, your brain registers deprivation before you even take the first bite. The meagreness of the serve looks depressing. This visual trigger creates anxiety and obsession. You become hyper-focused on food because your brain perceives a threat to your survival.

Meanwhile, volume eating fosters an abundance mindset. When you sit down to a plate that is heaped with food—even

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if half of that heap is steamed broccoli or a humongous garden salad—your brain registers a feast. The visual cue of a full plate creates a sense of safety and satisfaction. You are not cutting back on your intake; you are eating more. This removes the feeling of punishment and denial associated with weight loss.

Further, volume eating may help to break the binge-restrict cycle. Binges often occur when extreme restriction leads to voracious, uncontrollable hunger. When you keep the stomach full and satisfied with high-volume foods, the physical urgency to binge is reduced. You are helping to insulate yourself against the snack attacks that derail progress in the late evening. It is much harder to crave a bag of chips when you are physically stuffed from a dinner rich in fibrous vegetables and lean protein.

23.6. The composition of a high-volume plate

Implementing volume eating does not mean resigning yourself to a life of plain salads. It requires a culinary strategy centred on dilution and extension rather than elimination. You can take the foods that you love and lower their overall calorie density by integrating them with high-volume ingredients.

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The primary ingredient in this strategy is the vegetable. In the context of volume eating, vegetables are the main infrastructure of the meal. A common technique is the ratio swap. If you love pasta, then you do not have to abandon it. Instead, you can change the ratio. A typical pasta dish might be 90% noodles and 10% sauce and vegetables. A volume-adjusted pasta dish might be 40% noodles mixed with 60% zucchini noodles, spinach, mushrooms and onions. You still get the texture and flavour of the pasta, but the volume of the meal has doubled while the calories have dropped substantially.

This principle of extension applies to almost every dish. Rice can be mixed with riced cauliflower or konjac/shirataki rice in a 50/50 blend to create a hearty bowl of stir-fry base. Oatmeal can be volumized by grating in zucchini—often called zoats—or adding pumpkin purée, which absorbs water and expands the serving size without altering the flavour profile much. Scrambled eggs can be bulked up with tomatoes, spinach, capsicums and mushrooms so that two eggs feel like a meal for a king.

Fluidity also plays a major role. Water bound into the matrix of food appears to be more satiating than water drunk alongside food.[170] This is why soups and stews are effective

[170] Rolls, B. J., Bell, E. A., & Thorwart, M. L. (1999). Water incorporated into a food but not served with a food decreases energy intake in lean

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for volume eating. Research suggests that consuming a low-calorie, broth-based soup before a main meal can significantly reduce the total calories consumed during that meal.[171] The soup creates immediate gastric stretching, signalling the brain to slow down consumption before the main course even begins.

23.7. The role of fibre

While high volume is the primary driver of immediate fullness, fibre ensures that satiety persists. Volume alone—such as drinking a gallon of water—will stretch the stomach, but without substance, that liquid empties rapidly and hunger returns. To make volume eating effective for hours, it makes sense to integrate that physical bulk with fibre to provide a more sustained satiating effect.

Fibre, found in the cell walls of plants, resists enzymatic breakdown in the small intestine. It absorbs water and forms a gel-like substance (in the case of soluble fibre) or adds bulk (insoluble fibre), slowing the transit of food through the digestive tract. When you combine the immediate gastric stretching of high water-content foods with the delayed

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women. *The American Journal of Clinical Nutrition*, *70*(4), 448–455. doi:10.1093/ajcn/70.4.448

[171] Flood, J. E., & Rolls, B. J. (2007). Soup preloads in a variety of forms reduce meal energy intake. *Appetite*, *49*(3), 626–634. https://doi.org/10.1016/j.appet.2007.04.002

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gastric emptying of fibre, you trap that feeling of fullness, forcing the satiety signal to persist long after the meal is finished.

Low-calorie sources of fibre while dieting include psyllium husk, prebiotics and vegetables such as spinach, broccoli, cauliflower, asparagus, zucchini and Brussels sprouts. For a more comprehensive list of fibrous, PSMF-compliant vegetables and low-calorie staples, see chapter 30.

23.8. Navigating the pitfalls

Volume eating requires nuance to avoid some potential pitfalls. The most common error beginners make is a sudden, drastic increase in fibre intake. Going from a low-fibre diet to consuming mountains of raw cruciferous vegetables overnight can lead to digestive distress.[172] The transition to volume eating should be gradual, slowly increasing the ratio of vegetables over several weeks and emphasizing adequate hydration to help move that fibre through the system.

Another pitfall is treating high-volume foods as if they are entirely calorie-free. While it is hard to overeat plain strawberries or roasted zucchini, it is certainly possible. If

[172] Dahl, W. J., & Stewart, M. L. (2015). Position of the Academy of Nutrition and Dietetics: Health implications of dietary fiber. *Journal of the Academy of Nutrition and Dietetics*, *115*(11), 1861–1870. https://doi.org/10.1016/j.jand.2015.09.003

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you consume colossal portions of low-density foods under the assumption that they do not count, then those incremental calories will accumulate and can push you out of a deficit. Volume eating still obeys the laws of thermodynamics; it just makes adhering to a deficit easier. You should also be mindful of how these foods are prepared, as the dressing poured over a family bowl of salad can easily contain more calories than the vegetables themselves. If you are adding fat to a high-volume meal, then treat it as a garnish, e.g., using a sprinkle of feta cheese or a single teaspoon of olive oil.

A third pitfall is judging foods solely by their weight-to-calorie ratio. Because liquids like milk or fruit juice are primarily water, they are heavy, giving them a low calorie density by weight. If you strictly followed a calories-per-gram chart, then a large glass of milk might appear to be a sensible choice. However, as discussed earlier, liquids are textbook weight-gain foods because they require zero chewing and empty from the stomach rapidly. Conversely, consider aerated foods like popcorn. 100 grams of air-popped popcorn are about 380 calories—a figure that looks terrible on a calories-per-gram chart, appearing comparable to an equal weight in cheesecake or chocolate mudcake—but 100 grams of popcorn yield a substantial bowl that takes 15 minutes to chew through. Looking solely at a food's weight-to-calorie ratio is therefore myopic; you

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should also consider a food's physical volume, the mechanical effort and time required to consume it and how slowly it leaves the stomach.

23.9. The social component and flexibility

One of the criticisms of strict dieting is that it isolates the dieter. It is difficult to eat out with friends when your plan requires weighing 100 grams of chicken breast. Volume eating may be a source of social flexibility.

If you know that you are going to a birthday dinner where rich, calorically dense food will be served, then you can use volume eating strategies earlier in the day—relying on soups, large salads, lean proteins and fruits for breakfast and lunch—to bank calories for the evening. Further, when at a restaurant, the volume eater scans the menu for the meal that has the most bang for the buck. They might order the steak but swap the fries for a double side of steamed broccoli or start with a garden salad to pre-fill the stomach before the main course arrives.

This approach allows you to navigate the modern food environment—which is saturated with hyper-palatable and calorie-dense options—without having to retreat from society.

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23.10. Key takeaways

- Satiety can be achieved by stretching the stomach wall, as mechanoreceptors respond to the physical volume of food.
- Volume eating relies on shifting intake toward low-calorie density foods that are high in water, fibre and/or trapped air (e.g., non-starchy vegetables and some fruits).
- The visual cue of a full plate removes the feeling of deprivation associated with scarcity and may help to prevent the binge-restrict cycle.
- High-volume plates can be constructed by diluting calorie-dense ingredients (like rice or pasta) with low-calorie bulk (e.g., cauliflower rice, zucchini or broth-based soups).
- Fibre adds bulk and slows down gastric emptying, prolonging the feeling of fullness long after the meal is consumed.
- Volume eating allows you to bank calories earlier in the day with high-volume, low-calorie density meals to accommodate calorically denser social meals.

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Chapter 24. In praise of artificial sweeteners

Diet culture has long insisted that if a food tasted like a reward, then it must carry a metabolic penalty. Jack LaLanne famously encapsulated this ascetic philosophy with his command: 'if it tastes good, spit it out'. This view of dieting has led many to believe that the only path to a leaner physique is through the grim endurance of blandness. However, just as seasoning adds flavour to savoury foods without costing calories, so artificial sweeteners add flavour to foods that we expect to be sweet, and without incurring any pain. Artificial sweeteners, or Non-Nutritive Sweeteners (NNS), when used strategically, are a powerful tool in the modern arsenal for achieving and maintaining a calorie deficit without feeling deprived.

24.1. Sugar consumption and satiety

To understand why artificial sweeteners are an effective intervention for fat loss, we first have to accept the reality of the caloric profile of sucrose. Sucrose, or table sugar, is a dense source of energy that provides four calories per gram while offering negligible satiety. It is hyper-palatable, meaning that it triggers the brain's reward centres in a way that encourages overconsumption. In the context of the modern food environment, liquid sugar is particularly

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insidious. A single regular soda can contain upward of 40 grams of sugar—roughly 160 calories—that pass through the stomach without triggering the stretch receptors or hormonal signals that tell the brain, 'I have been fed'. This is the calorie surplus that goes unnoticed until it accumulates on the waistline.

This is where artificial sweeteners come into their own. If you replace that single full-sugar soda with a diet alternative, then you save 160 calories, all the while retaining the sensory experience of the drink. If you were to make that specific swap once a day for a year, then the mathematical difference would be nearly 55,000 calories. In terms of pure energy balance, assuming that all other variables are constant, that would equate to roughly 7 kilograms of fat prevented or lost. There are very few interventions in the fitness world that offer such a drastic magnitude of effect for such a minimal behavioural change.

24.2. The insulin myth

A common argument against non-nutritive sweeteners is the hypothesis that they disrupt metabolic health despite having zero calories. The most pervasive of these myths is the idea that the sweet taste alone triggers an insulin spike—a cephalic phase insulin response—that shuts down fat burning and stores fat just as surely as real sugar would.

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This claim has been tested and the results are liberating for the dieter. While it is true that the brain registers sweetness, the physiological response to non-nutritive sweeteners is negligible compared to sugar. A sip of diet soda does not flood the bloodstream with insulin in a way that meaningfully inhibits lipolysis, the breakdown of fat. Human clinical trials have repeatedly shown that replacing sugar-sweetened beverages with non-nutritive sweeteners results in weight loss, not gain or stagnation.[173] If the NNS-induced insulin spike were truly potent enough to halt fat loss, then these studies would show no difference between the control groups and the sweetener groups. Instead, the data favour the sweetener group, simply because they are consuming fewer total calories.

24.3. Sweeteners as a tool for long-term adherence

Beyond the physiology, we must address the psychology of the long-term diet. This is where artificial sweeteners are an effective behavioural tool. Adherence is the ultimate

[173] Rogers, P. J., Hogenkamp, P. S., de Graaf, C., Higgs, S., Lluch, A., Ness, A. R., Penfold, C., Perry, R., Putz, P., Yeomans, M. R., & Mela, D. J. (2016). Does low-energy sweetener consumption affect energy intake and body weight? A systematic review, including meta-analyses, of the evidence from human and animal studies. *International Journal of Obesity*, *40*(3), 381–394. https://doi.org/10.1038/ijo.2015.177

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determinant of weight loss success; because energy restriction triggers a compensatory increase in the drive to eat, many diets fail when that physiological pressure becomes unbearable.[174] We are evolutionarily hardwired to seek out sweet flavours, a preference developed to identify energy-dense food sources. Fighting millions of years of evolution with willpower alone is an uphill battle. Eventually, the will may break, leading to binges and the subsequent abandonment of the diet.

Artificial sweeteners allow us to decouple the sensation of sweetness from the energy cost of sugar. They allow the dieter to scratch the itch without derailment. Consider the scenario of a dieter who has been in a calorie deficit for six weeks. Their hunger hormones are elevated and they are desperate for comfort. In a world without non-nutritive sweeteners, their choice is binary: suffer through the craving or cave in and eat a calorie-dense dessert that might wipe out two days of progress. With sweeteners, a third option exists. They can consume a zero-calorie drink, a protein fluff made with sucralose or a bowl of yoghurt sweetened with stevia. This allows the dieter safely to satisfy the craving without compromising their calorie deficit.

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[174] Gibson, A. A., & Sainsbury, A. (2017). Strategies to improve adherence to dietary weight loss interventions in research and real-world settings. *Behavioral Sciences*, *7*(3), Article 44. https://doi.org/10.3390/bs7030044

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24.4. Safety and toxicity

The safety profile of the most common sweeteners—aspartame, sucralose, acesulfame potassium and stevia—is among the most exhaustively studied in the history of food science. Regulatory bodies worldwide, including the FDA and the European Food Safety Authority, have reviewed thousands of studies and deemed them safe for human consumption within the Acceptable Daily Intake (ADI) levels. These ADI levels are set so high that a person would need to consume an absurd amount—often equivalent to nearly twenty cans of diet soda every single day—to approach a threshold of concern.[175]

24.5. The gut microbiome

The most contemporary and nuanced argument against sweeteners concerns the gut microbiome. Recent studies have suggested that high doses of certain sweeteners, particularly saccharin and sucralose, may alter the composition of gut bacteria and potentially impact glucose tolerance. While this science is fascinating and worth

[175] European Food Safety Authority. (2013). Scientific opinion on the re-evaluation of aspartame (E 951) as a food additive. *EFSA Journal*, *11*(12), Article 3496. https://doi.org/10.2903/j.efsa.2013.3496; U.S. Food and Drug Administration. (2023). *Aspartame and other sweeteners in food*. https://www.fda.gov/food/food-additives-petitions/aspartame-and-other-sweeteners-food

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monitoring, it should be contextualized within the hierarchy of fat loss priorities. The negative health impacts of obesity—systemic inflammation, visceral fat accumulation, insulin resistance and increased risk of cardiovascular disease—are proven and severe. The theoretical risk of a minor perturbation in gut flora from a diet soda pales in comparison to the well-established health risks caused by carrying 15 kilograms of excess body fat. If artificial sweeteners allow a person to lose that fat, then the net health outcome is overwhelmingly positive. We would be trading a potential, minor and debated side effect for a guaranteed, major life-extension benefit.

24.6. The compensation theory

Another common concern relates to the theory of compensatory eating. This is the idea that because your body tastes the sweetness but does not receive the expected calories, it will drive you to eat more food later to make up the difference. While this mechanism can be observed in rat studies where the animals have no cognitive control over their environment, human studies tell a different story. In free-living humans, those who switch to diet beverages generally do not compensate by eating more food.[176] Even if a

[176] Peters, J. C., Wyatt, H. R., Foster, G. D., Pan, Z., Wojtanowski, A. C., Vander Veur, S. S., Herring, S. J., Brill, C., & Hill, J. O. (2014). The effects of water and non-nutritive sweetened beverages on weight loss during a

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non-nutritive sweetener triggers a craving for something sweet, you can simply satisfy that craving with more non-nutritive sweeteners. If a diet beverage makes you want dessert, then you can just eat a bowl of sugar-free jelly. You can keep satisfying the sweet craving with zero-calorie options until it dissipates.

24.7. The appeal to nature fallacy

We must also dismantle the appeal to nature fallacy that permeates the nutrition industry. There is a pervasive belief that because sugar is 'natural' (extracted from cane or beets) and aspartame is 'artificial' (synthesized in a lab), sugar must be safer. This is a dangerous heuristic. Nature is not intrinsically benign, just as the lab is not intrinsically sinister. Nature is full of toxins and the laboratory has produced life-saving medicines. In the specific context of fat loss and metabolic syndrome, natural sugar can be dangerous. While sugar does not cause fat gain in an isocaloric state (maintenance calories), its presence in hyper-palatable, liquid or processed forms can make maintaining a deficit significantly more difficult. It provides high energy with minimal gastric distension, frequently leading to an unintentional calorie surplus. Conversely, artificial sweeteners pass through the body largely inert, doing their

12-week weight loss treatment program. *Obesity*, *22*(6), 1415–1421. https://doi.org/10.1002/oby.20737

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job of flavouring without contributing to energy intake. We should not evaluate these substances based on a biased preference for their origins, whether natural or synthetic. Instead, we should evaluate them based on how they behave inside the human body and their impact on metabolic health.

24.8. Sweetness as a vehicle for protein

Further, we can look at the utility of sweeteners in the context of protein intake. High-protein diets are optimal for fat loss because, as we have noted, they preserve muscle mass and increase satiety. However, plain egg whites, tofu, tuna and seitan can become monotonous. Artificial sweeteners diversify your options by enabling sweet, high-protein alternatives. Protein powders, which are almost universally flavoured with NNS, allow for the creation of anabolic desserts—homemade protein bars, protein pancakes, smoothies and oatmeal—that taste like cheat meals but have excellent macronutrients. Sweeteners can make high-protein foods palatable and dessert-like, helping with your adherence to a high-protein, low-calorie diet.

24.9. Approaching artificial sweeteners pragmatically

There is, of course, a reasonable middle ground. Arguing that artificial sweeteners are effective for fat loss does not mean

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that they should constitute the base of one's hydration or diet. Water should always be the primary beverage. Whole, unprocessed foods should make up the majority of your calorie intake. A zero-calorie soda should replace a high-calorie soda, not a serving of vegetables. We should view sweeteners simply as a supplementary tool to make compliance easier.

The internet is rife with anecdotes of headaches or bloating attributed to sweeteners. If a specific sweetener causes you physical discomfort, then you should obviously avoid it, just as you would avoid dairy if you were lactose intolerant. But individual intolerance should not be confused with inherent toxicity. For the majority of the population, these compounds are biologically inert vectors of pleasure. They provide the sensory experience of indulgence without the metabolic consequence.

We should also consider the alternative. If one rejects artificial sweeteners on the grounds of purity, then what is the recourse for the sweet tooth? Usually, it is a bleak regimen of total abstinence, which drains willpower, or a moderation approach with real sugar, which can be stressful to maintain. If you refuse to use the tool of non-nutritive sweeteners, then you are fighting a war on two fronts: the hunger of the calorie deficit and the specific, nagging desire for sensory pleasure. Bringing sweeteners into the equation

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eliminates the second front, allowing you to focus all of your mental energy on maintaining the deficit.

24.10. Key takeaways

- Non-Nutritive Sweeteners (NNS) provide a welcome, minimal-effort caloric saving (e.g., replacing one full-sugar soda daily saves nearly 55,000 calories/year).
- NNS decouple the sensation of sweetness from the energy cost, preserving willpower and promoting long-term diet adherence.
- The fear that the sweet taste alone causes an insulin spike that halts fat burning is unsupported; NNS often lead to weight loss due to calorie reduction.
- Major regulatory bodies (e.g., the FDA, the EFSA) have deemed common NNS safe for consumption within their high Acceptable Daily Intake (ADI) levels.
- The theoretical risk of minor gut flora alteration is entirely eclipsed by the metabolic benefits of reversing obesity, a process that non-nutritive sweeteners facilitate.
- Studies on free-living humans show that NNS consumption generally does not cause compensatory eating; dieters can manage any minor biological urge.
- NNS can make high-protein foods (e.g., protein powders and anabolic desserts) palatable, supporting

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adherence to the primary muscle-sparing macronutrient.

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Chapter 25. On the importance of sleep

In the pursuit of fat loss, we often fixate on the visible and the tangible. We obsess over the specific macronutrient ratios on our plates while scrupulously tracking our tonnage lifted in the gym and the steps that we take during the day. These are the active and tangible pillars of transformation, the things that we do. However, there is a restorative component that is a physiological underpinning for these efforts: sleep. Rather than a state of mere inactivity, sleep is a period where the body facilitates tissue repair and modulates the hormonal profiles that support favourable body composition outcomes.

25.1. Cortisol and the stress of the deficit

When you are in a calorie deficit, your body is under stress. It is a controlled, purposeful stress, but stress nonetheless. You are asking your body to liberate stored energy to fuel your daily existence, a process that the body naturally resists. Sleep can be seen as the counterweight to that stress. It is the time when the sympathetic nervous system—the fight or flight mode that dominates high-intensity training and busy workdays—finally recedes, allowing the parasympathetic nervous system to take over. This transition is essential for lowering cortisol levels. Elevated cortisol, a byproduct of

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sleep deprivation,[177] is unwelcome during a fat-loss phase. While cortisol itself does not magically create fat out of thin air, it can increase cravings for highly palatable, calorie-dense foods.[178] As bad as this is, it is not the only mechanism through which sleep deprivation hinders fat loss.

25.2. The impact of sleep on ghrelin and leptin

As we established in chapter 22, the hormonal impact of sleep extends beyond cortisol; it manipulates the ghrelin-leptin axis. Because you already understand that ghrelin drives the urge to eat while leptin signals satiety, there is no need to review the biology. What is critical here is the speed at which sleep deprivation destabilizes this system.

Research demonstrates that just two consecutive nights of severely restricted sleep—4 hours a night—is enough to send

[177] Wright, K. P., Drake, A. L., Frey, D. J., Fleshner, M., Desouza, C. A., Gronfier, C., & Czeisler, C. A. (2015). Influence of sleep deprivation and circadian misalignment on cortisol, inflammatory markers, and cytokine balance. *Brain, Behavior, and Immunity*, *47*, 24–34. https://doi.org/10.1016/j.bbi.2015.01.004

[178] Tomiyama, A. J. (2019). Stress and obesity. *Annual Review of Psychology*, *70*(1), 703–718. https://doi.org/10.1146/annurev-psych-010418-102936

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ghrelin soaring and suppress leptin.[179] While you are unlikely to sleep this little in the real world, even a chronic, mild sleep debt nudges your appetite regulation in the wrong direction. Correcting your sleep duration helps to stabilize these signals.

25.3. Shrinking the feeding window

Beyond the hormonal advantages, there is a purely logistical benefit to prioritizing sleep: it shrinks your feeding window. Sleeping more simply leaves fewer waking hours in the day to feel hungry. If you are awake for 18 hours, then you have 18 hours during which you must endure the subtle gnawing of the deficit. If you sleep for nine hours, then you only have to battle your willpower for 15. Sleep is like a time machine that fast-forwards you to your next meal. By simply going to bed earlier, you remove hours that would otherwise require conscious discipline to survive.

25.4. Muscle preservation and sleep

Resistance training provides the stimulus to keep your muscle, but sleep provides the environment for that stimulus to take effect. It is during deep, slow-wave sleep that the

[179] Spiegel, K., Tasali, E., Penev, P., & Van Cauter, E. (2004). Brief communication: Sleep curtailment in healthy young men is associated with decreased leptin levels, elevated ghrelin levels, and increased hunger and appetite. *Annals of Internal Medicine*, *141*(11), 846–850. https://doi.org/10.7326/0003-4819-141-11-200412070-00008

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body releases the majority of its growth hormone.[180] This hormone promotes tissue repair and muscle preservation.[181] If you cut your sleep short, then you are cutting this recovery window short. You risk skewing your weight loss ratio unfavourably, losing muscle while holding onto body fat.

Indeed, scientific literature suggests that sleep restriction sabotages nutrient partitioning during a deficit. In a trial by Nedeltcheva and colleagues, subjects who restricted their sleep to 5.5 hours per night while in a calorie deficit experienced a 55% reduction in fat loss and a 60% increase in the loss of fat-free mass compared to those who slept 8.5 hours.[182] Although fat-free mass is not exclusively muscle—and these losses could have been mitigated by a high protein intake and resistance training—the underlying physiological penalty seems to be that undersleeping causes the body to preserve body fat at the expense of your lean tissue.

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[180] Van Cauter, E., & Plat, L. (1996). Physiology of growth hormone secretion during sleep. *The Journal of Pediatrics*, *128*, S32–S37. https://doi.org/10.1016/s0022-3476(96)70008-2

[181] Kraemer, W. J., Ratamess, N. A., Hymer, W. C., Nindl, B. C., & Fragala, M. S. (2020). Growth Hormone(s), Testosterone, Insulin-Like Growth Factors, and Cortisol: Roles and Integration for Cellular Development and Growth With Exercise. *Frontiers in Endocrinology*, *11*. https://doi.org/10.3389/fendo.2020.00033

[182] Nedeltcheva, A. V., Kilkus, J. M., Imperial, J., Schoeller, D. A., & Penev, P. D. (2010). Insufficient sleep undermines dietary efforts to reduce adiposity. *Annals of Internal Medicine*, *153*(7), 435–441. https://doi.org/10.7326/0003-4819-153-7-201010050-00006

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25.5. Biasing calories for sleep

Gaining a perfect night of sleep is often easier said than done, especially when in a calorie deficit. A common complaint during a fat-loss phase is hunger-induced insomnia. Your brain, sensing a lack of energy availability, increases alertness to encourage you to go out and forage for food.[183] Lying in bed staring at the ceiling with a growling stomach is a common misery for the dieter, but it is a misery that can be managed with strategic calorie timing.

Conventional wisdom often suggests that you should eat a large breakfast and 'eat like a pauper' at night to avoid storing fat. As well as being largely obsolete in general, in the specific context of a calorie-controlled diet, this advice can be counterproductive. Total energy balance over the course of 24 hours is the primary driver of weight change. Therefore, you have the freedom to distribute those calories in a way that best supports your adherence and your sleep.

If hunger keeps you awake, then saving a portion of your daily calorie allowance for a pre-bed meal or a substantial dinner can be highly effective. Consuming carbohydrates in the evening can aid in the production of serotonin, a

[183] Rodgers, R. J., Ishii, Y., Halford, J. C. G., & Blundell, J. E. (2002). Orexins and appetite regulation. *Neuropeptides*, *36*, 303–325. https://doi.org/10.1016/s0143-4179(02)00085-9

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precursor to melatonin, the hormone that regulates the sleep-wake cycle.[184] Backloading your calories ensures that you are most satiated during the window where willpower is sometimes lowest and the need for rest is highest. You effectively trade a bit of hunger in the morning, when you are busy and caffeine-fuelled, for peace and satiety at night.

This strategy is not universally applicable. If you suffer from Gastro-Oesophageal Reflux Disease (GORD) or are prone to frequent acid reflux, then lying down with a full stomach can cause physical discomfort and pain. This can disrupt your sleep just as severely as hunger would. In this scenario, biasing your calories toward the evening may not make sense. You might be better off distributing your meals more evenly throughout the day or front-loading your calories, ensuring that your final meal of the day is consumed several hours before getting into bed to allow for proper digestion.

25.6. Optimizing the sleep environment

Creating the right environment for sleep calls for a high level of attention. The bedroom should be an environment dedicated to recovery. This means controlling the variables of light and temperature. Our circadian rhythms are

[184] Afaghi, A., O'Connor, H., & Chow, C. M. (2007). High-glycemic-index carbohydrate meals shorten sleep onset. *The American Journal of Clinical Nutrition*, *85*(2), 426–430. https://doi.org/10.1093/ajcn/85.2.426

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influenced by light exposure. In the modern world, we are bombarded by blue light from screens late into the evening, which tricks the brain into thinking that it is still daytime and suppresses melatonin production.[185] Establishing a digital sunset, where screens are dimmed or turned off an hour before bed, signals to the body that the day is done.

Temperature may play an even greater role. For the body to initiate sleep, your core body temperature needs to drop slightly.[186] A room that is too warm can inhibit this process and lead to restless, fragmented sleep; and the same can occur with too many thick layers of bedclothes. A cool, ventilated room can facilitate this thermal regulation, as can a bed with conservative layers of insulation. It is also beneficial to establish a wind-down routine. This could involve quieting the mind with a book or releasing physical tension through light stretching and controlled breathing. These rituals cue your nervous system that it is time to wind down.

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[185] Cajochen, C., Frey, S., Anders, D., et al. (2011). Evening exposure to a light-emitting diodes (LED)-backlit computer screen affects circadian physiology and cognitive performance. *Journal of Applied Physiology*, *110*, 1432-1438. https://doi.org/10.1152/japplphysiol.00165.2011

[186] Harding, E. C., Franks, N. P., & Wisden, W. (2019). The temperature dependence of sleep. *Frontiers in Neuroscience*, *13*, Article 336. https://doi.org/10.3389/fnins.2019.00336

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25.7. Assessing the impact of acute sleep deprivation

In our pursuit of optimization, we should be careful not to create a new source of anxiety. It is all too easy to become obsessed with having the perfect sleep to the point where the fear of not sleeping keeps you awake. This is where it helps to zoom out and look at the bigger picture. It is inevitable that you will have bad nights. You might have a stressful day at work, a child might wake you up or you might simply toss and turn for no apparent reason. When this happens, it is imperative that you do not panic.

One bad night of sleep will not ruin your fat-loss progress. It will not suddenly cause you to gain two kilograms of fat overnight. If your fundamentals are in place—if you are in a calorie deficit, if you are consuming sufficient protein and if you are engaging in resistance training—then you have a reliable safety net. As we have described them, these three pillars are the primary drivers of your transformation. Sleep strengthens the pillars and makes them more effective, but the physiological process of fat loss does not significantly falter simply because recovery was suboptimal for twenty-four hours.

When you wake up after a poor night's sleep, the best approach is simply to stay the course. You may feel fatigued

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and your hunger signals might be elevated due to the temporary spike in ghrelin, but you can intellectually override these signals because you understand their source. You do not need to overhaul your diet or abandon the plan. The resilience of the human body is well developed from millennia of evolution. It can overcome a bout of sleeplessness without the lost hours of sleep compromising your fat loss goals, provided the pillars of your nutrition and training remain firm.

25.8. Key takeaways

- Just two nights of restricted sleep destabilize the appetite hormones, causing the hunger hormone (ghrelin) to soar and the satiety hormone (leptin) to plummet.
- Adequate sleep lowers the stress hormone cortisol, which, when chronically elevated, can lead to cravings.
- Studies suggest that undersleeping sabotages fat loss by causing the body to preserve fat at the expense of lean body mass.
- Sleeping more hours shrinks the waking feeding window, reducing the total time during the day that requires conscious willpower to manage hunger and adhere to the deficit.

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- To combat hunger-induced insomnia, it may make sense to bias calories (particularly carbohydrates) toward the evening to promote fullness and aid in the production of melatonin.
- In your quest for fat loss, one bad night of sleep is not the end of the world.

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Chapter 26. Dietary supplements

If body composition is a cathedral, then supplements are merely the spire at the very top. They are the final touch, completely useless without a rock-solid structure beneath them. If you are not in a calorie deficit, if your protein intake is low and if your training stimulus is insufficient to retain lean tissue, then the most expensive supplementation protocol in the world will result in nothing more than expensive urine.

That said, once the heavy lifting of diet and exercise is accounted for, a few select supplements can offer a legitimate, if marginal, advantage. In a fat-loss phase, you can encounter the following seven problems: (1) micronutrient deficiencies; (2) decreased training performance; (3) impaired recovery; (4) increased hunger; (5) impaired bowel regularity; (6) fatigue; and (7) sleep disruptions. The role of the supplements outlined in this chapter is to attend to these problems so that you can keep moving forward at maximum speed.

26.1. Creatine monohydrate

We begin with the safest, most researched, affordable and effective performance supplement, which ironically, is often the first thing that dieters cut from their stack: creatine

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monohydrate. There is a pervasive myth in the fitness industry that creatine is exclusively for bulking and that using it during a fat-loss phase will lead to unwanted water retention and a puffy look. While it is true that creatine pulls water into the body, it pulls that water into the muscle cell (intracellular hydration), not under the skin (subcutaneous retention), so it will not lead to a puffy appearance.[187]

Muscle loss is bad during a fat-loss phase. A primary way to prevent muscle loss is to maintain your strength in the gym. If you can continue to lift the same weight for the same reps while losing body fat, then you are essentially forcing your body to hold onto lean tissue. Creatine can be thought of as a reserve fuel source for high-intensity efforts, replenishing adenosine triphosphate (ATP) stores rapidly. This may allow you to grind out those final two reps of a leg press when you are tired and under-fuelled. If you are preserving your performance—which creatine may help with—then you are preserving your muscle mass.

Ignore the fancy buffered or liquid versions that cost three times as much; three to five grams of simple creatine

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[187] Antonio, J., Candow, D. G., Forbes, S. C., Gualano, B., Jagim, A. R., Kreider, R. B., Rawson, E. S., Smith-Ryan, A. E., VanDusseldorp, T. A., Willoughby, D. S., & Ziegenfuss, T. N. (2021). Common questions and misconceptions about creatine supplementation: what does the scientific evidence really show? *Journal of the International Society of Sports Nutrition*, *18*. https://doi.org/10.1186/s12970-021-00412-w

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monohydrate daily are all that is required to saturate the muscle and help protect your gains from the catabolic depredations of dieting.

26.2. Caffeine

Next, we turn our attention to the world's most popular psychoactive drug, which happens to be one of the few legitimate performance enhancers available at your local grocery store: caffeine.

Research suggests that caffeine improves performance across a broad range of exercise tasks, including strength, endurance and power output.[188] As to caffeine's more direct fat-loss benefits, research suggests that caffeine can modestly increase energy expenditure and suppress appetite.[189]

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[188] Grgic, J., Grgic, I., Pickering, C., Schoenfeld, B. J., Bishop, D. J., & Del Coso, J. (2020). Wake up and smell the coffee: Caffeine supplementation and exercise performance—an umbrella review of 21 published meta-analyses. *British Journal of Sports Medicine*, *54*(11), 681–688. https://doi.org/10.1136/bjsports-2018-100278

[189] Harpaz, E., Tamir, S., Weinstein, A., & Weinstein, Y. (2016). The effect of caffeine on energy balance. *Journal of Basic and Clinical Physiology and Pharmacology*, *28*, 1–10. https://doi.org/10.1515/jbcpp-2016-0090; Schubert, M. M., Irwin, C., Seawright, R. F., Oliver, S. R., Grant, G., & Desbrow, B. (2017). Caffeine, coffee, and appetite control: a review. *International Journal of Food Sciences and Nutrition*, *68*(8), 901–912. https://doi.org/10.1080/09637486.2017.1320537

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Caffeine is an adenosine antagonist. Adenosine is a chemical that accumulates in the brain throughout the day, signalling fatigue. Caffeine blocks the adenosine receptors, effectively masking that fatigue. This allows you to maintain a high training intensity and keeps your daily activity levels up when your biology is telling you to sit on the couch.

Practically speaking, a black coffee in the mid-morning can blunt hunger between breakfast and lunch, making adherence to your calorie cap easier. Your caffeine should always come from low- or zero-calorie sources, such as black coffee or sugar-free energy drinks. Getting your caffeine fix through cream-heavy lattes or syrupy energy beverages introduces hundreds of hidden calories, negating any fat-loss advantage.

However, if your caffeine use ruins your sleep, then you negate the benefits. Use it strategically, ideally pre-workout or during maximum hunger windows, and not too close to bedtime.

26.3. Vitamin D

In the modern world, vitamin D deficiency is rampant. We spend the majority of our time indoors, and even when we venture out, we shield our skin with both clothing and high-SPF sunscreen. During a fat-loss phase, when you are

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placing your body under the stress of restriction and hard training, a compromised immune system is a common side effect.[190] Vitamin D protects your immunity, minimizing the likelihood of missing training days due to illness.[191]

The standard recommended daily allowances are often inadequate for optimal functioning, essentially serving only to prevent rickets. For fat loss and heavy training, a dosage of 3000–5000 IU daily is a robust standard.[192] This dosage is generally high enough to correct deficiencies and maintain optimal blood levels without reaching toxicity.

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[190] Ohta, S., Nakaji, S., Suzuki, K., Totsuka, M., Umeda, T., & Sugawara, K. (2002). Depressed humoral immunity after weight reduction in competitive judoists. *Luminescence*, *17*(3), 150–157. https://doi.org/10.1002/bio.686

[191] Martineau, A. R., Jolliffe, D. A., Hooper, R. L., Greenberg, L., Aloia, J. F., Bergman, P., Dubnov-Raz, G., Esposito, S., Ganmaa, D., Ginde, A. A., Goodall, E. C., Grant, C. C., Griffiths, C. J., Janssens, W., Laaksi, I., Manaseki-Holland, S., Mauger, D., Murdoch, D. R., Neale, R., ... Camargo, C. A., Jr. (2017). Vitamin D supplementation to prevent acute respiratory tract infections: Systematic review and meta-analysis of individual participant data. *The BMJ*, *356*, Article i6583. https://doi.org/10.1136/bmj.i6583; Walsh, N. P. (2019). Nutrition and athlete immune health: New perspectives on an old paradigm. *Sports Medicine*, *49*(Suppl 2), 153–168. https://doi.org/10.1007/s40279-019-01160-3

[192] Liu, M.-C., Weng, P.-W., Chen, S.-C., Liu, T.-H., Huang, H.-W., Huang, C.-T., Yang, C.-T., Mishra, V. K., & Yang, M.-T. (2023). Immunologic, anti-inflammatory, and anti-muscle damage profile of supplemented vitamin D3 in healthy adults on strenuous endurance exercise. *Biology*, *12*(5), 657. https://doi.org/10.3390/biology12050657

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Because vitamin D is a fat-soluble vitamin, taking it on an empty stomach reduces its efficacy. To ensure optimal absorption, you should take it alongside a meal containing dietary fat. A practical strategy is to consume your vitamin D concurrently with your daily fish oil supplement.

26.4. Protein powder

Protein powders—whether whey, casein, egg or plant-based isolates—are often sold in supplement stores, but they are technically just powdered food. They do not possess special pharmacological properties that chicken breast or tofu lacks. However, they are highly convenient (and in my opinion, quite palatable as well).

As we have observed, one of the primary drivers of muscle retention during a deficit is protein intake. You need to provide a surplus of amino acids to prevent the body from breaking down muscle tissue for energy. Achieving high protein targets can be difficult when your calorie cap is low. Rich cuts of meat or whole eggs come with concomitant fats that eat up your calorie budget. Protein powder, by contrast, has one of the highest protein-to-calorie ratios available. A scoop of whey protein isolate might contain 25 grams of protein for only 110 calories, a difficult ratio to replicate with whole foods.

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However, a word of caution is necessary: as discussed in §23.4, liquid calories are generally less satiating than solid food. If you are struggling with extreme hunger, then drinking your calories in a shake might leave you feeling empty ten minutes later. In such cases, using protein powder to make a fluff (see §31.2) or sludge or baking with it can create a more filling meal.

26.5. Multivitamin

When you cut food volume, you often cut the total intake of vitamins and minerals. Even if you are eating 'clean', the reduction in quantity often means that you are ingesting fewer micronutrients than you would at maintenance. This is where a high-quality multivitamin can help.

It is fashionable in some 'natural' circles to claim that a multivitamin is unnecessary if one eats a balanced diet. In a surplus, this is likely true. In a steep deficit, it is a gamble. A shortage of zinc can drop testosterone;[193] a lack of B vitamins can impair neurological functioning;[194] insufficient

[193] Prasad, A. S., Mantzoros, C. S., Beck, F. W. J., Hess, J. W., & Brewer, G. J. (1996). Zinc status and serum testosterone levels of healthy adults. *Nutrition*, *12*(5), 344–348. https://doi.org/10.1016/s0899-9007(96)80058-x

[194] Kennedy, D. (2016). B Vitamins and the Brain: Mechanisms, Dose and Efficacy—A Review. *Nutrients*, *8*(2), 68. https://doi.org/10.3390/nu8020068

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magnesium can impair sleep and recovery.[195] You might not feel a buzz from taking a multivitamin and it will not directly incinerate body fat, but it may prevent nutrient deficiencies.

You do not need to purchase the most expensive athlete packs with twelve pills per serving. A comprehensive, single-tablet multivitamin that covers 100% of the RDA for major trace minerals and vitamins is sufficient. It can be thought of as a safety net. It catches any micronutrients that might have been neglected in your diet plan.

26.6. Melatonin

Falling asleep—and staying asleep—is often more difficult while dieting. This is where melatonin proves invaluable. Melatonin is the hormone responsible for signalling to your central nervous system that it is time to power down. Exogenous melatonin helps to initiate sleep and mitigate nighttime restlessness.

The commercial supplement industry frequently peddles melatonin in excessive doses of 5 to 10 milligrams. This hyper-dosing can be counterproductive. It frequently leads to a hangover effect of next-day lethargy and grogginess.

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[195] He, C., Wang, B., Chen, X., Xu, J., Yang, Y., & Yuan, M. (2025). The mechanisms of magnesium in sleep disorders. *Nature and Science of Sleep*, *17*, 2639–2656. https://doi.org/10.2147/NSS.S552646

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The clinical sweet spot for sleep initiation—without the residual side effects—is surprisingly small. You should aim for a dose of 0.3 to 1.0 milligrams, taken approximately 30 to 60 minutes before you intend to sleep.[196] If you are currently taking a 10-milligram dose and feeling sluggish the next morning, then seeking out a low-dose alternative will likely yield superior results.

26.7. Fish oil or algae oil

As detailed in chapter 7, essential fatty acids are just that: essential. They cannot be synthesized endogenously and must be ingested for survival. Though the threshold to stave off clinical deficiency is minimal, supplementing with fish oil or algae oil to reach 2–4 grams of combined EPA and DHA per day is a solid target for health and performance. Intakes below this range likely do not offer the same benefits.

For people managing obesity, clinical hypertriglyceridemia or pre-existing cardiovascular conditions, achieving a clinically significant drop in triglycerides—specifically a reduction of 15 to 30%—can be achieved with an intake exceeding two grams of combined EPA and DHA daily. This target is

[196] Zhdanova, I. V., Wurtman, R. J., Morabito, C., Piotrovska, V. R., & Lynch, H. J. (1996). Effects of low oral doses of melatonin, given 2–4 hours before habitual bedtime, on sleep in normal young humans. *Sleep*, *19*(5), 423–431. https://doi.org/10.1093/sleep/19.5.423

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supported by a 2023 review that aggregated data from over 72,000 subjects across 90 trials. There was a dose-dependent response; while the physiological benefits do not scale infinitely, escalating the daily dosage of these marine fatty acids seems to track reliably with improvements in cardiovascular risk markers.[197]

Adequate consumption of these essential fats may help with cognitive and psychological stability. Low intakes of EPA and DHA are correlated with an increased susceptibility to clinical depression and bipolar disorder.[198] In athletic populations, reaching optimal intake thresholds has been observed to protect against anxiety and support enhanced psychological resilience.[199] Further, meta-analytic data support the beneficial effects of EPA and DHA on depressive symptoms, up to doses of around 1 gram of EPA per day.[200]

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[197] Wang, T., Zhang, X., Zhou, N., Shen, Y., Li, B., Chen, B. E., & Li, X. (2023). Association Between Omega-3 Fatty Acid Intake and Dyslipidemia: A Continuous Dose–Response Meta-Analysis of Randomized Controlled Trials. *Journal of the American Heart Association*, *12*. https://doi.org/10.1161/jaha.123.029512

[198] Grosso, G., Galvano, F., Marventano, S., Malaguarnera, M., Bucolo, C., Drago, F., & Caraci, F. (2014). Omega-3 Fatty Acids and Depression: Scientific Evidence and Biological Mechanisms. *Oxidative Medicine and Cellular Longevity*, *2014*, 1–16. https://doi.org/10.1155/2014/313570

[199] Wilson, P. B., & Madrigal, L. A. (2017). Associations among Omega-3 Fatty Acid Status, Anxiety, and Mental Toughness in Female Collegiate Athletes. *Journal of the American College of Nutrition*, *36*, 602–607. https://doi.org/10.1080/07315724.2017.1335249

[200] Liao, Y., Xie, B., Zhang, H., He, Q., Guo, L., Subramanieapillai, M., Fan, B., Lu, C., & McIntyre, R. S. (2019). Efficacy of omega-3 PUFAs in

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At a cellular level, these compounds seem to be mediators of the body's defence mechanisms. They downregulate inflammatory pathways and thereby bolster overall immune efficacy and offer targeted therapeutic relief for autoimmune disorders, e.g., rheumatoid arthritis.[201] However, a daily intake in excess of 2 grams of combined EPA and DHA is typically necessary to trigger these adaptations.[202] Further, this systemic regulation seems to be a protective measure

depression: A meta-analysis. *Translational Psychiatry*, *9*(1), Article 190. https://doi.org/10.1038/s41398-019-0515-5

[201] Li, X., Bi, X., Wang, S., Zhang, Z., Li, F., & Zhao, A. Z. (2019). Therapeutic Potential of ω-3 Polyunsaturated Fatty Acids in Human Autoimmune Diseases. *Frontiers in Immunology*, *10*. https://doi.org/10.3389/fimmu.2019.02241; Raad, T., Griffin, A., George, E. S., Larkin, L., Fraser, A., Kennedy, N., & Tierney, A. C. (2021). Dietary Interventions with or without Omega-3 Supplementation for the Management of Rheumatoid Arthritis: A Systematic Review. Nutrients, 13, 3506. https://doi.org/10.3390/nu13103506

[202] Calder, P. C. (2013). Omega-3 polyunsaturated fatty acids and inflammatory processes: nutrition or pharmacology? *British Journal of Clinical Pharmacology*, *75*(3), 645–662. https://doi.org/10.1111/j.1365-2125.2012.04374.x; Wang, W., Xu, Y., Zhou, J., & Zang, Y. (2024). Effects of omega-3 supplementation on lipid metabolism, inflammation, and disease activity in rheumatoid arthritis: a meta-analysis of randomized controlled trials. Clinical Rheumatology, 43, 2479–2488. https://doi.org/10.1007/s10067-024-07040-0

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against chronic conditions such as hypertension and diabetes.[203]

From an endocrinological standpoint, consistent intake appears to alter energy partitioning positively. While the magnitude of the effect is modest, these fats seem to discourage lipogenesis (the storage of adipose tissue) while mildly promoting lipid oxidation (fat burning) and may enhance hypothalamic leptin sensitivity.[204] This neuro-metabolic adaptation may help the brain to recognize satiety signals during periods of calorie restriction.

For women, an optimal intake seems to mitigate the severity of premenstrual syndrome.[205] Further, maternal DHA supply

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[203] Bayram, S. Ş., & Kızıltan, G. (2024). The Role of Omega- 3 Polyunsaturated Fatty Acids in Diabetes Mellitus Management: A Narrative Review. *Current Nutrition Reports*, *13*, 527–551. https://doi.org/10.1007/s13668-024-00561-9; Ellulu, M. S., Khaza'ai, H., Patimah, I., Rahmat, A., & Abed, Y. (2016). Effect of long chain omega-3 polyunsaturated fatty acids on inflammation and metabolic markers in hypertensive and/or diabetic obese adults: a randomized controlled trial. Food & Nutrition Research, 60, 29268. https://doi.org/10.3402/fnr.v60.29268

[204] Albracht-Schulte, K., Kalupahana, N. S., Ramalingam, L., Wang, S., Rahman, S. M., Robert-McComb, J., & Moustaid-Moussa, N. (2018). Omega-3 fatty acids in obesity and metabolic syndrome: A mechanistic update. *The Journal of Nutritional Biochemistry*, *58*, 1–16. https://doi.org/10.1016/j.jnutbio.2018.02.012

[205] Mohammadi, M. M., Dehghan Nayeri, N., Mashhadi, M., & Varaei, S. (2022). Effect of omega-3 fatty acids on premenstrual syndrome: A systematic review and meta-analysis. *Journal of Obstetrics and Gynaecology Research*, *48*(6), 1293–1305. https://doi.org/10.1111/jog.15217

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is a building block for foetal neurodevelopment. Following childbirth, sustaining these lipid levels simultaneously safeguards the mother against postpartum depressive episodes while fostering general neonatal vitality.[206]

Optimal EPA/DHA saturation may also be beneficial to resistance training. Neurologically, these fats have been shown to upregulate Brain-Derived Neurotrophic Factor (BDNF), dopamine and serotonin, which may increase central nervous system drive and thereby improve explosive power and motor skill acquisition. Physiologically, they may compress the post-training recovery window by blunting acute inflammation and oxidative stress. Finally, they may optimize the delivery of oxygen and nutrients during heavy exertion by remodelling the cardiovascular lipid profile.[207]

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[206] Jiang, Y., Chen, Y., Wei, L., Zhang, H., Zhang, J., Zhou, X., Zhu, S., Du, Y., Su, R., Fang, C., Ding, W., & Feng, L. (2023). DHA supplementation and pregnancy complications. *Journal of Translational Medicine*, *21*. https://doi.org/10.1186/s12967-023-04239-8

[207] Okut, S., Ozan, M., Buzdağli, Y., Uçar, H., İnaç, M. R., Han, M. T., Bayram, E., & Kiliç Baygutalp, N. (2025). The effects of omega-3 supplementation combined with strength training on neuro-biomarkers, inflammatory and antioxidant responses, and the lipid profile in physically healthy adults. Nutrients, 17(13), Article 2088. https://doi.org/10.3390/nu17132088; Tomczyk, M., Heileson, J. L., Babiarz, M., & Calder, P. C. (2023). Athletes can benefit from increased intake of EPA and DHA—Evaluating the evidence. *Nutrients*, *15*(23), Article 4925. https://doi.org/10.3390/nu15234925

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To maximize absorption and minimize gastrointestinal side effects (such as fish burps), these supplements should be taken alongside whole-food meals. If you are taking a larger dose to reach the 2–4-gram target, then you can split the capsules across multiple meals throughout the day rather than taking them all at once.

Prioritizing these polyunsaturated fats would seem to provide extensive improvements to many major bodily systems.

26.8. Calcium

The inclusion of calcium in a fat-loss stack is contingent on your dietary choices. Many dieters, in an effort to reduce calories, cut out dairy products, because milk, cheeses and yoghurts are often high in calories or fat. While this elimination saves energy, it creates a void in calcium intake.

As well as being essential for bone health, calcium plays an important role in muscle contraction. Without sufficient calcium ions, your muscles cannot fire with maximum force, reducing the quality of your workouts.[208] Further, there is interesting, albeit debated, literature suggesting that adequate

[208] Allen, D. G., Lamb, G. D., & Westerblad, H. (2008). Skeletal muscle fatigue: Cellular mechanisms. Physiological Reviews, 88(1), 287–332. https://doi.org/10.1152/physrev.00015.2007

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calcium intake may assist in fat loss by binding to dietary fats in the digestive tract, preventing their absorption and increasing their excretion.[209] However, we should not rely on this hypothesized mechanism for meaningful calorie reduction.

If you are consuming dairy products regularly, then you likely do not need to supplement. However, if your diet is largely dairy-free, or if you rely solely on whey isolate (which has much of the calcium removed), then a calcium supplement becomes advisable. Whether or not you supplement, you should meet the recommended daily intake (usually around 1,000 mg).[210]

26.9. Prebiotics

While probiotics—the live bacteria residing in your gut—receive the lion's share of supplement marketing, prebiotics are arguably the more impactful focus for a dieter.

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[209] Christensen, R., Lorenzen, J. K., Svith, C. R., Bartels, E. M., Melanson, E. L., Saris, W. H., Tremblay, A., & Astrup, A. (2009). Effect of calcium from dairy and dietary supplements on faecal fat excretion: a meta-analysis of randomized controlled trials. *Obesity Reviews*, *10*(4), 475-486. https://doi.org/10.1111/j.1467-789X.2009.00599.x

[210] Institute of Medicine Committee to Review Dietary Reference Intakes for Vitamin D and Calcium. (2011). *Dietary reference intakes for calcium and vitamin D* (A. C. Ross, C. L. Taylor, A. L. Yaktine, & H. B. Del Valle, Eds.). National Academies Press. https://doi.org/10.17226/13050

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Prebiotics are simply non-digestible plant fibres and are the primary food source for those beneficial bacteria.

During a fat-loss phase, total food volume decreases. Even if you are prioritizing vegetables, your overall variety and total intake of dietary fibre often shrink, which can inadvertently starve your healthy gut flora. This can lead to gastrointestinal distress.

Further, managing hunger is the ultimate battle of any diet. Prebiotic fibres—such as inulin or Partially Hydrolysed Guar Gum (PHGG)—absorb water and slow down gastric emptying. This physical expansion and delayed digestion keep you feeling fuller for longer, blunting the hunger pangs that accompany a calorie deficit.

Ideally, your prebiotic intake should come from whole foods such as garlic, onions, asparagus, apples and oats. However, if your calorie cap restricts you from hitting your daily fibre target (generally 25–35 grams minimum),[211] then a prebiotic fibre supplement is an advantageous tool for both gut health and appetite suppression.

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[211] Barber, T. M., Kabisch, S., Pfeiffer, A. F. H., & Weickert, M. O. (2020). The health benefits of dietary fibre. *Nutrients*, *12*(10), 3209. https://doi.org/10.3390/nu12103209

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A word of caution: if your digestive system is not accustomed to a high fibre intake, then do not immediately introduce a high dose of prebiotics. Doing so may result in gastrointestinal distress. Start with a conservative dose of 3–5 grams per day, accompanied by plenty of water, and slowly titrate the dose upward over several weeks as your gut microbiome adapts.

26.10. Psyllium husk

Psyllium husk is a viscous, soluble fibre. During a steep calorie deficit, two problems often arise: hunger and compromised bowel motility. Psyllium husk addresses both. When ingested, it absorbs much water, swelling to form a thick, viscous gel. In the stomach, this gel stretches the gastric walls and delays gastric emptying, providing a sensation of fullness. In the colon, psyllium adds bulk to your stool and keeps the digestive tract moving.

When ingesting psyllium husk, it is imperative to consume it with a large volume of water, as it requires fluid to form its gel and move through the system safely.[212] Further, because of its highly absorptive nature, this gel can trap and prevent

[212] Hefny, A. F., Ayad, A. Z., Matev, N., & Bashir, M. O. (2018). Intestinal obstruction caused by a laxative drug (Psyllium): A case report and review of the literature. *International Journal of Surgery Case Reports*, *52*, 59–62. https://doi.org/10.1016/j.ijscr.2018.10.001

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the absorption of other substances.[213] Therefore, it may be advisable to take psyllium husk at least one to two hours apart from your other supplements or any prescription medications.

As with prebiotics, it makes sense to start conservatively with 5 grams—approximately one teaspoon—per day to allow your digestive tract to adapt. If well-tolerated, then you can gradually titrate the dose up to 10–20 grams daily.

26.11. Key takeaways

- Supplements are largely useless for fat loss without the foundation of a calorie deficit, sufficient protein and resistance training. However, once those foundations are in place, supplements can offer a small advantage.
- Supplements worth considering during a fat-loss diet include:
    - creatine monohydrate (3–5 grams daily);
    - caffeine;
    - protein powders;
    - melatonin (0.3–1.0 milligrams daily);
    - fish oil or algae oil (2–4 grams of combined EPA/DHA daily);

[213] González Canga, A., Fernández Martínez, N., Sahagún Prieto, A. M., García Vieitez, J. J., Díez Liébana, M. J., Díez Láiz, R., & Sierra Vega, M. (2010). Dietary fiber and its interaction with drugs. *Nutrición Hospitalaria*, *25*(4), 535–539. https://doi.org/10.3305/nh.2010.25.4.4610

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- vitamin D (3000–5000 IU daily);
- a multivitamin;
- calcium (especially if restricting dairy);
- prebiotics (3–5 grams daily to start, to manage hunger and support gut health when food volume is low); and
- psyllium husk (5–20 grams daily, taken with ample water, away from other supplements/medications).

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Chapter 27. How to track weight loss progress

One reason people fail at losing weight is not a lack of willpower or laziness. It is often a simple misrecognition of how body weight fluctuates.

We tend to assume that if we cut calories today, then we will see a lower number on the scale tomorrow. But the human body is messy. It behaves less like a calculator and more like a volatile stock market. It has good days, bad days and long stretches where nothing seems to happen, even if the overall trend is moving in the right direction.

Burning fat and losing weight rarely happen at the same speed. It is possible to burn body fat for two weeks straight while the scale stays the same or even goes up. This happens because of water retention, digestion, hormonal changes or changes in glycogen storage masking the fat loss.

To succeed, you have to stop looking at the scale as a daily judge of your effort and focus on the long-term trend instead.

27.1. The rolling average

To even out the emotional rollercoaster of dieting, you need to desist from obsessing over your weight on any single day.

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Your weight on a Tuesday does not matter. What matters is the trend; the direction that your body is moving in over time.

27.1.1. How to collect the right data

The secret to this system is the weekly average. Your daily weight fluctuates too much to be useful on its own, but if we collect enough days, then the tranche becomes more reliably indicative.

Here is how to do it:

1. Weigh yourself every single morning. You want as many data points as possible—ideally seven days a week—to get an accurate picture.
2. Weigh yourself right after you wake up and use the toilet, but before you eat or drink anything. This keeps the conditions the same every time.
3. Get the right tool. Old-fashioned dial scales are not precise enough. You need a digital scale. Even better, get a smart scale (like a Withings or Fitbit) that automatically sends the number to your phone. This stops you from having to write it down every day, which makes it easier to stick to the habit. (Note: ignore the body fat percentage numbers these scales

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give you; they are usually wrong. Just look at the total weight.)

27.1.2. Finding your true weight

At the end of the week, do not focus on your lightest day or your heaviest day. Instead, find the middle ground.

Add up all seven of your daily weights and divide by seven. For example, if your weights for the week add up to 585.3 kg, then you divide that by 7 to get 83.6 kg.

That number—83.6—is your true weight for the week. It ignores the temporary water weight spike from a salty meal or a big dinner and gives you a single, reliable number to track your progress.

27.1.2.1. Automating the process with an app

Doing these maths on a calculator every Sunday is inefficient. The easiest way to guarantee consistency and obviate manual calculations is to use a smartphone app designed for weight trending.

Apps like Happy Scale (for iOS) and Libra (for Android) integrate the concept of the rolling average. You simply log your weight each morning, and the software automatically calculates your average and plots a smoothed-out trendline.

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If you pair one of these apps with the smart scale mentioned earlier (syncing through Apple Health or Google Fit), then the entire process—from stepping on the scale to calculating your weekly average—requires zero manual entry.

27.1.2.2. Automating the process in Excel or Google Sheets

If you prefer not to use a dedicated app and want to make your own tool, then you can easily make a spreadsheet that tracks your daily weigh-ins and automatically calculates your weekly averages for an entire year.

Here is how to make this tool in Microsoft Excel or Google Sheets from scratch in five minutes:

1. Create a new document. In the very first row, label your three primary columns. Type ‘Date’ into cell A1, ‘Daily weight’ into cell B1 and ‘Weekly average’ into cell C1.
2. In cell A2, type your starting date (for example, 01/01/2026). In cell A3, type the next day’s date (01/02/2026). Highlight both of these cells, click the small square in the bottom-right corner of the highlighted box and drag your cursor all the way down to row 366. The software will recognize the pattern and automatically fill in a complete year’s worth of consecutive dates.

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3. Begin logging your morning weigh-ins in column B. At the end of your first week, click into cell C8 (which corresponds to your seventh day). Type the formula =AVERAGE(B2:B8) and press enter. The software will calculate your mean weight for that first week.
4. Click on cell C8 and copy it. Then, move seven rows down to cell C15 and paste it. The software is smart enough to adjust the new formula to =AVERAGE(B9:B15) automatically. Continue pasting this formula every seven rows—C22, C29, C36 and so on—all the way down the spreadsheet to populate your year fully.

An advantage of using this spreadsheet formula is its ability to accommodate missing days. If you happen to miss a morning weigh-in and leave a cell completely blank, then the =AVERAGE function will divide the weekly total only by the six days that you did record rather than punishing you with an inaccurate result by factoring in a zero.

27.1.2.3. Visualizing the trendline

Looking at a column of descending numbers is satisfying but translating that data into a visual trendline is yet more gratifying. Here is how to turn your spreadsheet into a graph:

1. Click on the letter ‘A’ at the top of your first column to highlight all of your dates. Then, hold down the Ctrl

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key (or Cmd on a Mac) and click the letter ‘C’ at the top of your third column to highlight all of your weekly averages.
2. With both columns highlighted, navigate to the top menu bar. In Google Sheets, click Insert, then select Chart (the software will usually default to a line graph automatically). In Microsoft Excel, click Insert, navigate to the charts section and select a Line Chart. A graph plotting your weight over time will appear on your screen.
3. To refine the visual, double-click the vertical axis numbers on the chart to open the formatting menu. From there, adjust the ‘Minimum’ and ‘Maximum’ bounds to sit just a few kilograms below and above your current weight, respectively.

27.2. The fortnightly review

Now that you are tracking your weekly average, you need to learn when to act on it. A sensible approach is to collect data every week, but judge progress every two weeks.

27.2.1. How to compare the numbers

When you want to see how you are doing, look back two weeks. Specifically, compare week 4 against week 2.

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Why skip week 1? Because as discussed in §8.2.2, the first week of any diet is a false start. You lose a lot of weight very quickly, but most of it is just water and glycogen. By week 2, the water has settled and the data become actionable.

To find your true rate of fat loss, simply take the difference between your week 4 average and your week 2 average, and divide that figure by two.

Example:
Imagine you start your diet on week 1.

- Week 1 average: 71.5 kg (you drop weight rapidly here, mostly water).
- Week 2 average: 70.0 kg (start here. The water weight is mostly gone; this is your first valid data point).
- Week 3 average: 69.6 kg (ignore for now).
- Week 4 average: 69.2 kg (compare here).

If you were to compare week 4 to week 1, then it would look as if you lost 2.3 kg. That would be misleading because of the initial water drop.

Instead, we compare week 4 against week 2:

$$70 \text{ kg} - 69.2 \text{ kg} = 0.8 \text{ kg total loss.}$$

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Since this loss happened over two weeks, we divide by two to find your weekly rate of loss:

$$0.8 \text{ kg} / 2 = \mathbf{0.4} \text{ kg per week.}$$

27.2.2. Interpreting non-linear weight data

You need to be prepared for the fact that weight loss rarely translates into consistent, daily reductions on the scale; instead, there are usually extended plateaus interrupted by sudden decreases.

It is normal for your average weight to stay flat for two weeks and then suddenly drop sharply in the third week. This is caused by your body holding onto water, which is eventually expelled in a whoosh, i.e., a sudden, overnight flushing of retained water that finally reveals the actual fat loss you had been achieving all along. There is no need to panic and adjust your calorie intake during the perceived stall in week two.

27.2.3. Considerations for the menstrual cycle

For women, the menstrual cycle adds noise to the data. Hormonal fluctuations cause water retention that will temporarily mask fat loss on the scale, but the timing of this retention varies from person to person. Some women

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experience a scale spike during the luteal phase, others during menstruation, others around ovulation.[214]

The most accurate approach is to look at your data across full cycles, comparing the same biological phase from one month to the next (e.g., comparing your post-period week in cycle two against your post-period week in cycle one). Just keep collecting the numbers and pay attention to the longer-term trend.

When you want to see how you are doing, look back one full menstrual cycle (typically four weeks). To find your true rate of fat loss, take the difference between the same phase in both cycles and divide by the number of weeks that have passed.

Example:
Imagine you track your weight and notice a predictable water-weight spike during your luteal phase (week 3 of your cycle).

Cycle 1

- Week 1 average (post-period): 70.0 kg (start here).

[214] Koşar, Ş. N., Güzel, Y., Köse, M. G., Kin İşler, A., & Hazır, T. (2022). Whole and segmental body composition changes during mid-follicular and mid-luteal phases of the menstrual cycle in recreationally active young women. *Annals of Human Biology*, *49*, 124–132. https://doi.org/10.1080/03014460.2022.2088857

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- Week 2 average (ovulation): 69.6 kg.
- Week 3 average (luteal phase): 70.4 kg (water retention temporarily masks your fat loss).
- Week 4 average (menstruation): 69.3 kg.

Cycle 2

- Week 1 average (post-period): 68.4 kg (compare here).

If you were to compare cycle 1's week 3 against week 2, then it would look as if you had gained 0.8 kg. That would be frustrating and misleading due to the hormonal water retention.

Instead, we compare cycle 2, week 1 against cycle 1, week 1.

$$70.0 \text{ kg} - 68.4 \text{ kg} = 1.6 \text{ kg total loss.}$$

Since this loss happened over a four-week cycle, we divide by four to find your true weekly rate of fat loss:

$$1.6 \text{ kg} / 4 = \mathbf{0.4} \text{ kg per week.}$$

27.3. How to fix a true plateau

We have established that many ‘stalls’ are just illusions caused by water weight. However, if you have done your review and the maths show that you genuinely are not losing

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enough weight, then—and only then—do we make an adjustment.

27.3.1. Basic adjustment calculations

If you find that you are missing the target that you set for yourself, then the fix is simple maths. It does not matter if you aimed for 0.5 kg or 1.5 kg; the method for correcting the discrepancy is always the same: for every 0.1 kg (0.2 lbs) by which you are short of your target, you need a 110-calorie daily adjustment.

Here is how to make the adjustment:

1. Find the gap: let us say you set an aggressive target of 1.0 kg per week. Your review shows that you only lost 0.7 kg per week. You are short by 0.3 kg.
2. Calculate the fix: since you missed by 0.3 kg, you need to increase your daily deficit by 330 calories.
3. Choose your method to secure the 330-calorie deficit:
    a. Remove 330 calories of food from your day.
    b. Add activity that burns 330 calories (e.g., briskly walk 8,000 extra steps).
    c. Cut 165 calories of food and briskly walk 4,000 extra steps.

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You simply calculate the gap between what you wanted and what you got and then close it.

27.3.2. What to cut (and what to keep)

If you decide to remove those 330 calories by cutting food, then the most important rule is to try to protect your protein intake (meat, fish, eggs, tofu). As we have often noted, protein keeps you full and preserves your muscle. Instead, look at the extras: the carbohydrates and fats. Can you skip an apple? Use a little less oil? Cut a handful of almonds?

The source of the calories matters less than what they add up to. Trim the edges of your diet, keep the core protein and you will get the scale moving again.

27.3.3. A note for PSMF users

If you are executing a Protein-Sparing Modified Fast (PSMF; see chapter 14), then the adjustment calculations detailed here are largely inapplicable. A PSMF, by definition, restricts calorie intake to the minimum required to prevent muscle loss. There are no discretionary macronutrients—carbohydrates or nonessential fats—remaining to be removed. Attempting to reduce food intake further would risk muscle loss. If you are strictly adhering to a PSMF and still find the rate of loss to be insufficient, then there is no further nutritional adjustment

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available; you have reached the maximum safe dietary restriction and must generally allow the process to occur.

The only permissible exception for increasing the net energy deficit applies to competitive bodybuilders facing a fixed competition date with an inadequate rate of fat loss. Because the nutritional floor has already been reached, any additional deficit must be generated entirely through increased physical activity. This is best achieved via Low-Intensity Steady State (LISS) exercise, such as walking, to create a larger deficit without compromising protein intake. (Note: the superior decision in this circumstance is usually to pick a later show or abstain from competing entirely.)

27.4. Putting it all together

Here is how the entire operation works in practice. It starts with a simple daily ritual: step on the scale every morning. Treat this number like a piece of data to collect and immediately forget.

Once the week is over, take those seven numbers and find the average. This single number is your true weight for the week.

However, you do not react to this number immediately. You wait. Every two weeks, compare your current average to

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where you were two weeks ago (for example, comparing week 4 to week 2). Be sure to filter out any bad-data weeks, such as the very first week of the diet (which is mostly water loss) or weeks affected by the menstrual cycle.

If—and only if—this comparison shows that you are missing your target, then you apply the fix. For every 0.1 kg by which you are off your target, increase your deficit by 110 calories, either by trimming a little food or adding a short walk.

27.5. Key takeaways

- Stop viewing the scale as a daily judge of effort, as body weight fluctuates wildly due to water retention, digestion, hormonal changes and changes in glycogen storage.
- Weigh yourself every single morning to collect data, then calculate the weekly average of those daily weigh-ins. This rolling average is a more reliable number to track the long-term trend of your progress.
- Judge your true rate of fat loss every two weeks (a fortnightly review) by comparing your current weekly average to the average from two weeks prior (e.g., week 4 vs. week 2), while filtering out the initial water loss from week 1 and any weeks affected by the menstrual cycle.

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- If the fortnightly review shows that you are genuinely missing your target rate of loss, then make a mechanical adjustment: increase your daily deficit by 110 calories for every 0.1 kg by which you are off your target (e.g., by cutting food and/or adding extra steps).

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Chapter 28. Diet breaks: why, when and how

A diet break is a controlled period of time, typically lasting between one and two weeks, where you deliberately increase your calorie intake. Specifically, you should raise your calories to a level that is approximately 5 to 10% below your predicted maintenance level. A diet break is not an excuse to stop tracking your food or eat whatever you want.

This specific target—just under maintenance—provides the physiological and psychological relief of eating at maintenance while keeping a safety buffer. Aiming slightly low ensures that even if you slightly overshoot your numbers or underestimate the calorie density of a meal, you are unlikely to enter a calorie surplus and gain unwanted body fat.

This chapter details why, when and how to integrate diet breaks.

28.1. The rationale for diet breaks

Prolonged dieting requires a high degree of cognitive effort to effect the necessary restraint. The constant vigilance required to stick to a deficit can create a mental load. Over

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time, this diet fatigue accumulates, leading to obsession with food and a higher likelihood of eating off plan.

Knowing that you only have to sustain a deficit for a few more weeks before a scheduled break can make the restriction more bearable. During the break, the ability to eat larger portions, enjoy social meals with less anxiety and feel physically fuller reduces the sense of deprivation. This restoration of normality refreshes your willpower reserves. When you return to the deficit after the break, you do so with renewed focus and motivation.

28.2. Evidence in practice: the MATADOR study

The theoretical benefits of diet breaks were put to the test in the MATADOR study, an acronym for Minimising Adaptive Thermogenesis And Deactivating Obesity Rebound. Published in the *International Journal of Obesity*, this study compared two groups of participants. One group followed a continuous calorie restriction for sixteen weeks. The other group alternated between two weeks of dieting and two weeks of eating at maintenance, continuing this cycle until they had accumulated sixteen weeks of time in the deficit.

The results were a welcome validation of the diet break methodology. The intermittent group lost considerably more

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weight and body fat than the continuous group: specifically, the intermittent group lost 14.1 kg compared to just 9.1 kg in the continuous group, representing a 50% greater total weight loss.[215] While the 30-week duration of the intermittent protocol might initially appear as a drawback compared to the 16-week continuous model, the total time spent actively dieting was identical. Both groups spent 16 weeks in a calorie deficit.

It is highly probable that the superior results were not solely due to a faster metabolism. The study relied on free-living participants, meaning that unreported slip-ups were entirely possible. The psychological relief of a break almost certainly improved dietary adherence. It is far easier to endure a deficit when you know that a reprieve is only two weeks away. In the continuous group, the grind never stopped, perhaps leading to burnout and unreported snacking. Ultimately, the specific mechanism matters less than the outcome. Whether the advantage was metabolic (burning more calories), behavioural (cheating less) or some combination, the diet break proved to be a superior tool. It provided the clinical validation for what bodybuilders and

[215] Byrne, N. M., Sainsbury, A., King, N. A., Hills, A. P., & Wood, R. E. (2018). Intermittent energy restriction improves weight loss efficiency in obese men: the MATADOR study. *International Journal of Obesity*, *42*(2), 129–138. https://doi.org/10.1038/ijo.2017.206

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physique coaches have long suspected: sometimes, to move forward faster, you have to stop moving.

28.3. Frequency and timing

Establishing that diet breaks are effective is the easy part; implementing them requires nuance. You cannot simply apply a generic template to every person. The frequency of diet breaks should be determined by your starting point and the aggressiveness of your diet.

The general rule of thumb relies on an inverse relationship between body fat and diet break frequency. A person with higher levels of body fat has a protective buffer against the hormonal impact of dieting. Their higher leptin levels and ample energy reserves allow them to sustain a deficit for longer periods before experiencing extreme hunger. Conversely, a lean person—someone nearing the end of a contest prep or trying to achieve single-digit body fat—is fighting biology tooth and nail. For them, the body perceives the deficit as an immediate existential threat, and the hormonal crash occurs much faster. Consequently, the leaner you are, the more frequently you may need to take breaks.

Similarly, the size of the deficit matters. A large calorie deficit is more stressful on the body than a moderate one. Therefore, the combination of your current body fat levels

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and the aggressiveness of your cut determines your ideal diet break frequency:

- Take breaks more frequently (e.g., every 2 to 6 weeks) if you are already quite lean (under 15% body fat for men, 24% for women) or if you are using a large calorie deficit (≥1% body weight loss per week).
- Take breaks less frequently (e.g., every 6 to 12+ weeks) if you carry a higher amount of body fat or if you are using a moderate to conservative calorie deficit (≤1% body weight loss per week).

These timelines are not set in stone; they are simply heuristics to help you plan. If you reach the theoretical due date for a diet break but you are feeling highly motivated and your training is going well, then you can keep going. You can extend the deficit phase until you feel the need for a reprieve. Conversely, you should take a break when you feel as if you are starting to crack. It is always better to implement a diet break proactively rather than trying to push it one week further and rolling off the rails.

28.4. Implementation

When the time comes to implement your diet break, execution is key. It is not enough simply to 'eat more'. You

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should approach the break with the same discipline you apply to the deficit.

First, recalculate your maintenance calories using the methods outlined in chapter 8. Your metabolism has likely slowed slightly and you are lighter than when you began, so your maintenance now will be lower than it was on day one. Set your calories 5 to 10% below this new number. This ensures that even if you miscalculate, you remain in a neutral or very slightly negative energy balance.

Second, the increase in calories should ideally come primarily from carbohydrates. Leptin secretion is more responsive to glucose metabolism than to fat intake.[216] If you prioritize carbohydrates—fruits, pasta, rice, potatoes, breads—then you maximize the hormonal boost of the break. Keep protein high to support satiety and muscle retention and keep dietary fats at moderate levels.

Third, you should resist the temptation to fill your newly increased calorie budget with low-volume, highly palatable foods. Your daily meals should look similar to what you ate during the deficit, simply in larger quantities. The reason for

[216] Dirlewanger, M., di Vetta, V., Guenat, E., Battilana, P., Seematter, G., Schneiter, P., Jequier, E., & Tappy, L. (2000). Effects of short-term carbohydrate or fat overfeeding on energy expenditure and plasma leptin concentrations in healthy female subjects. *International Journal of Obesity*, *24*(9), 1113–1119. https://doi.org/10.1038/sj.ijo.0801395

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this is that coming out of a prolonged deficit, your satiety signals are blunted.[217] If the increase to your energy intake comes predominantly from hyper-palatable, calorie-dense foods, then you risk exacerbating your hunger. Because these foods lack volume, protein and fibre, they are effortlessly overeaten and can easily cause you to blow past your maintenance threshold. Stick to the high-volume choices that got you here.

Finally, prepare yourself for the scale weight to spike. When you increase carbohydrate intake, you replenish depleted glycogen stores in the muscle and liver. For every gram of glycogen stored, the body stores approximately three to four grams of water.[218] In addition, the extra food bulk in your digestive tract can cause your weight to spike. Because of this, it is not uncommon to gain one to two kilograms (approximately two to four pounds) in the first few days of a diet break. You must understand that this extra weight is not fat. Do not panic. Do not slash calories in a knee-jerk reaction. The water weight component often stabilizes or

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[217] Sumithran, P., Prendergast, L. A., Delbridge, E., Purcell, K., Shulkes, A., Kriketos, A., & Proietto, J. (2011). Long-term persistence of hormonal adaptations to weight loss. *The New England Journal of Medicine*, *365*(17), 1597–1604. https://doi.org/10.1056/NEJMoa1105816

[218] Fernández-Elías, V. E., Ortega, J. F., Nelson, R. K., & Mora-Rodriguez, R. (2015). Relationship between muscle water and glycogen recovery after prolonged exercise in the heat in humans. *European Journal of Applied Physiology*, *115*(9), 1919–1926. https://doi.org/10.1007/s00421-015-3175-z

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even drops toward the end of the break as cortisol levels—which cause water retention—decrease due to the reduced stress of the diet.

28.5. Taking a diet break when you catch a cold

If you catch a cold while dieting, then take a diet break. A calorie deficit while sick will likely prolong your recovery and run you into the ground.

Fighting an infection is an energy-intensive process. A calorie deficit is an added physiological stressor. When you restrict calories while your immune system is working hard, you starve your body of the resources that it needs to heal. Instead of a quick bounce-back, a minor sickness can drag on for weeks, leaving you drained and incapable of training effectively anyway.

When you are sick, abort the deficit. Bring your calories back to maintenance—or even slightly above—to give your immune system the energy that it requires. Do not resume the cut or engage in strenuous resistance training until your symptoms clear and your usual vitality returns.

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28.6. The return to the cut

Ending the diet break can be mentally challenging, as you have to give up the extra food and return to restriction. However, you will likely find that your hunger is more manageable and your energy in the gym is higher. You are re-entering the deficit with a rested mind. The diet break is a reminder that you are not sentenced to a life of perpetual restriction, which paradoxically makes the restriction easier to endure. The finish line is back in sight and the momentum of rapid, visible progress can begin anew.

28.7. Key takeaways

- A diet break is a controlled, 1–2 week period where you intentionally raise calories to approximately 5–10% below your predicted maintenance level to provide relief.
- The break reduces overall diet fatigue, restoring willpower and likely improving long-term adherence.
- The frequency and duration of breaks should be determined by your leanness and the aggressiveness of your diet; the leaner you are or the larger your deficit, the more often you should implement a break.
- For implementation, you should recalculate your now-lower maintenance calories, then prioritize increasing your calorie budget primarily from

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carbohydrates to restore hormonal balance, while keeping protein intake high.

- Be prepared for the scale weight to spike by 1–2 kilograms (roughly 2–4 pounds) in the first few days of the break; this gain is water weight from replenishing glycogen stores, not fat, and should be ignored.
- If you catch a cold, then take an unplanned diet break.

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Chapter 29. Achieving extreme leanness and peaking for a bodybuilding show or photoshoot

Even when stripping away the final layers of adipose tissue and peaking your physique for a specific day, nothing fundamentally changes about human physiology. Getting from very lean to extremely lean still comes down to the same trinity that governed your initial fat loss—the three pillars—you must be in a calorie deficit, you should consume sufficient protein and you should engage in resistance training.

However, while the fundamental rules do not change, the margins for error become less tolerant. You cannot outwork a miscalculated diet in the final two weeks, nor can you rely on a magical peak week to burn fat that should have been lost a month ago. A true peak week is about manipulating muscle glycogen and intracellular water to create an illusion of muscular fullness while maintaining a sharp, crisp look. Make no mistake, however: manipulating intracellular water does not mean restricting your hydration or electrolytes. Throughout this entire peaking protocol—from the first day right up until you step on stage—there is no water or sodium manipulation. You will drink water according to your thirst and salt your food to taste just as you always have.

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If the fat is not already gone, then no peaking strategy in the world will save you. Assuming that you have done the work and you are genuinely lean enough, we can implement a careful strategy to manipulate your physiology for that single day. The following protocol is based on the peak executed by my friend, OCB Pro Larry Shipe Jr.

While this specific timeline worked flawlessly for Larry, I recommend running a mock peak or testing a carb load several weeks prior to your actual competition. You might find that your physique looks its best—perfectly full and dry—the day immediately following a carb load. Alternatively, like Larry, you might discover that you peak perfectly two days after the carb load.

29.1. 15 to 4 days out: the depletion phase

The peaking protocol begins fifteen days before your show or photoshoot. From fifteen days out down to four days out, you will enter a Protein-Sparing Modified Fast (PSMF; see chapter 14). For these twelve days, your diet will consist almost entirely of lean protein—set high at 3.3 grams per kilogram of your lean body mass—and fibrous, non-starchy vegetables.[219]

[219] A caveat must be applied here regarding your starting point. If you are already carrying exceptionally low levels of adipose tissue—truly

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The purpose of this PSMF phase is twofold. First, it creates a substantial calorie deficit, forcing the body to oxidize any stubborn, remaining trace of subcutaneous fat. Second, and essential for the peaking process, this absence of dietary carbohydrates will deplete your muscles of glycogen. As we have already noted, glycogen is the stored form of carbohydrate within the muscle tissue. As you continue to train heavy during these twelve days, you will wring your muscles dry of their fuel stores. You will feel terrible. Your energy will plummet, your mood will darken and when you look in the mirror, you will quite likely look flat and deflated. You must understand, however, that you are not losing muscle. Rather, you are emptying the muscle cells of water and glycogen. You are creating a localized demand for carbohydrates within the muscle tissue, effectively turning your muscles into dry sponges waiting for water.

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stage-lean with minimal subcutaneous fat left to oxidize—then a twelve-day PSMF will lead to overdieting and potential muscle catabolism. If you are already in this ultra-lean condition fifteen days out—say, because you are competing in a series of shows and already achieved stage-leanness for a prior event—then you should maintain a slight deficit or even maintenance calories up until seven or eight days out, effectively condensing this PSMF depletion phase to a safer three to four days.

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29.2. 3 and 2 days out: the carbohydrate load

This suffering paves the way for the magic that occurs both three and two days out from your event: the carbohydrate load.

To prime your body for what is to come, you will perform a final full-body depletion workout three days out, right before you begin the carb load. This session should consist of 3–4 sets of 15–20 reps per body part. Do not train to failure; you want zero muscle damage and no soreness. The sole purpose of this workout is to squeeze out any remaining muscle glycogen to maximize the sponge-like effect of the incoming carbohydrates. Once you step out of the gym after this session, there will be no other training until show day (besides perhaps some light posing practice).

With the depletion workout complete, you will take on a big carbohydrate load while dropping your protein intake to 2.2 grams per kilogram of lean body mass to accommodate the digestive demand. Because you have spent the last twelve days depleting your glycogen stores and increasing your muscles' insulin sensitivity, your body is primed to absorb a generous amount of carbohydrates into the muscle tissue, bypassing fat storage entirely. On these two days, three and two days out, you will consume 6.5 grams of carbohydrates per kilogram of your lean body mass. For an athlete with 80

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kg of lean body mass, this equates to 520 grams of carbohydrates daily, or 1,040 grams across the 48-hour period.

Consuming this volume of food requires you to rely on highly digestible, low-fibre and low-fat carbohydrate sources to avoid gastrointestinal distress. Simple sugars will be the essential resource (think plain bagels, jasmine rice, sugary breakfast cereals). You should keep your dietary fat low on this day to ensure rapid gastric emptying and to prevent any potential fat storage. As you eat throughout the day, every gram of carbohydrate stored as glycogen in the muscle pulls approximately three to four grams of water along with it. Because your muscles are acting like a vacuum, they will pull this water from under your skin and shuttle it directly into the muscle belly. Before your very eyes, you will witness the flatness vanish. Your muscles will swell and your vascularity will reach frightening new levels.

We do this loading phase three and two days out, rather than the day before the show, for a specific reason: digestion and settling. Pushing thousands of calories and hundreds of grams of carbohydrates through your digestive tract can cause slight water retention and a distended abdomen. Completing the big job of the carbohydrate load 48 hours prior to the stage gives your digestive system ample time to process the volume

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of food. We allow the gut to clear and the glycogen fully to integrate and settle into the muscle tissue.

29.3. 1 day out: refinement and resting

This brings us to one day out. Today is about refinement. You will pivot back to the PSMF, pushing protein back up to 3.3 grams per kilogram of lean body mass while eliminating dietary carbohydrates and fats completely from the equation once again. You are no longer trying to force anything into the muscle. Returning to this severe deficit and trace carbohydrate restriction acts as a vacuum to pull any lingering extracellular water out from under your skin, shrink-wrapping it around the fullness that you achieved the days prior. This day is about resting. You should stay off your feet, manage your stress and let the physiological dust settle. If you correctly conducted the protocols of the previous days, then you will wake up on this day looking fuller and drier than you have ever looked.

29.4. Show day

Finally, you reach show day, or the day of the photoshoot. On this day, keep food intake to a minimum until the celebratory meal after you step off stage. You will rely almost entirely on the loaded glycogen from the days prior. There is a temptation on the morning of a show to gorge yourself on a

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sugary pump-up meal—pancakes, doughnuts, candy bars or sodium-laden fast food—under the mistaken belief that it will suddenly force more vascularity or fullness. This is the fastest way to ruin weeks of discipline. If your muscles are already full from the loading phase two days out, then adding a massive influx of sugar and sodium on show day will only result in gastric distension and water retention under the skin. Your intake on show day is purely reactive; if you find yourself looking slightly flat, then you might consume a rice cake or two to nudge your fullness, but otherwise, you eat very little and sip your water according to thirst.

While your heavy resistance training has remained largely unchanged throughout the entirety of the peaking protocol, you will not perform a standard workout on show day. Instead, shortly before stepping on stage, you can execute a light, high-repetition pump workout specifically for the upper body (similar to the beginner home gym routine from chapter 19, but excluding the lower body movements). Driving blood into the upper body musculature enhances vascularity and creates temporary size, but you must strictly avoid pumping the legs; leg fatigue will wash out your separation and leave you shaking under the lights. You secure the pump, and then you go out and display the natural physique that you have earned.

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29.5. The peaking timeline

Date	Protein	Carb	Fat
19 Sep (15 days out) to **30 Sep** (4 days out)	3.3 g/kg LBM	Trace	Trace
1 Oct (3 days out) to **2 Oct** (2 days out)	2.2 g/kg LBM	6.5 g/kg LBM	Trace
3 Oct (1 day out)	3.3 g/kg LBM	Trace	Trace
4 Oct (show day)	Minimal	Reactive (e.g., rice cakes if flat)	Trace

29.6. Key takeaways

- Achieving extreme leanness requires adhering to the three pillars (a calorie deficit, sufficient protein and resistance training) until the fat is *already* gone. The

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final peaking weeks are about manipulating muscle glycogen and intracellular water to create an illusion of maximum size and definition.

- From 15 to 4 days out, initiate a Protein-Sparing Modified Fast (PSMF).
- From 3 and 2 days out, introduce a carbohydrate load (6.5 g/kg of lean body mass daily) while dropping protein slightly.
- 1 day out, go back to the PSMF.
- Throughout the peak, do not manipulate water or sodium intake. Drink to thirst and salt your food as you always have.
- On show day, avoid a large pump-up meal. Food intake should be minimal and purely reactive. Only perform a light, high-repetition pump workout for the upper body shortly before stepping on stage, strictly avoiding leg exercises.

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Chapter 30. Groceries

The following grocery list is purposefully curated to support a Protein-Sparing Modified Fast (PSMF). There are two reasons that this list looks the way that it does:

> (1) on a PSMF, you have almost zero caloric overhead, meaning that every gram of fat or sugar matters, which is why you will see an emphasis on low-carb, low-fat foods; and
> (2) when calories are low, hunger is the enemy, which is why this list prioritizes high-volume, low-calorie foods (like konjac noodles and fibrous greens) to distend the stomach and trigger satiety signals without adding much energy.

If you are not currently on a PSMF and are instead following a more moderate deficit, then consider this list your high-protein foundation. You can—and should—complement these items with healthy fats (avocados, nuts, olive oil) and complex carbohydrates (fruits, oats, potatoes) to fill out your remaining calorie budget.

Always check labels to ensure that you are not buying full-cream dairy or marinades loaded with sugar and oils.

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30.1. Produce aisle (fresh)

The bulk of your meal volume comes from here. You may eat from these categories in large quantities to stretch the stomach, provided that you avoid starchy or more calorie-dense vegetables (e.g., potatoes, corn, peas and carrots).

Leafy greens
Rocket (arugula), cabbage, endive, kale, lettuces (iceberg, romaine, butter), mustard greens, radicchio, spinach, Swiss chard, watercress.

Cruciferous
Broccoli, broccolini, Brussels sprouts, bok choy (or choy sum), cauliflower.

Fleshy and water-dense
Asparagus, capsicum (bell peppers), celery, cucumber, eggplant (aubergine), mushrooms (white, Swiss brown, portobello), okra, radishes, rhubarb, zucchini.

Aromatics and heat
Chives, fennel, fresh ginger root, fresh horseradish, leeks, onions (brown and red), scallions (spring onions), shallots, garlic bulbs, fresh hot peppers (jalapeño, serrano, fresno), fresh wasabi.

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Fresh herbs and fruit
Basil, bay laurel, borage, caraway, catnip, chervil, coriander (cilantro), dill, epazote, lavender, lemon grass, lemon balm, lemon verbena, lovage, marjoram, mints, nasturtium, oregano, parsley, rosemary, sage, salad burnet, savoury, scented geranium, sorrel, tarragon, thyme; fresh lemons and limes (for juice).

30.2. Meat and seafood

Look for the leanest cuts available (skinless, visible fat trimmed).

Poultry
Chicken breast (skinless), turkey breast, extra-lean chicken mince (ground breast), extra-lean turkey mince.

Beef and pork
The leanest cuts of red meat including sirloin, fillet (tenderloin), top round and 96% lean (or higher) beef mince. For pork, use trimmed pork tenderloin.

Game meats
Kangaroo, venison, ostrich, wild boar. (Game meats are naturally very lean.)

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Lean deli meats
Cubed or sliced chicken breast, turkey breast, extra-lean ham or extra-lean roast beef.

Seafood
White fish fillets (cod, snapper, hoki, barramundi, tilapia, halibut), shrimp and prawns (raw or cooked, peeled), scallops, lobster.

30.3. Dairy and eggs (refrigerated)

Strictly low-fat/fat-free options.

Items
Liquid egg whites (cartons) or fat-free egg substitutes (like Egg Beaters), fat-free plain Greek yoghurt (e.g., YoPro, Chobani Fit)/skyr/kefir, cottage cheese (fat-free or 1% low-fat), non-fat or ultra-low-fat grated cheese (mozzarella, cheddar, etc.).

30.4. Vegan and plant-based (refrigerated and dry)

Essential if following the vegan recipes from chapter 31, optional for variety otherwise.

Items

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Silken tofu (low fat), firm tofu (high-protein/pressed), seitan (vital wheat gluten; check for no added oil), tempeh (check macros), almond milk (unsweetened).

30.5. Frozen aisle

Usually cheaper and just as nutritious.

Items

Frozen strawberries (essential for fluff recipes), cauliflower rice (if not making fresh), broccoli and cauliflower mix, frozen white fish fillets or shrimp (budget option).

30.6. Pantry and dry goods

Protein powders

Casein protein (vanilla or chocolate; essential for fluff/pudding texture), whey protein isolate (vanilla or salted caramel), vegan protein isolate (soy or pea/rice blend).

Thickeners and baking

Xanthan gum, guar gum, psyllium husk, PB2/powdered peanut butter (defatted), cocoa powder (unsweetened), sugar-free jelly/jello crystals, nutritional yeast (savoury cheesy flavour), non-nutritive sweetener (erythritol, sucralose, stevia drops), cacao nibs.

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Canned and jarred
Tuna or canned chicken breast (must be in springwater/brine, never oil), passata/tomato purée (check for no added sugar), bamboo shoots, water chestnuts, bean sprouts, pickled cucumber, sauerkraut, kimchi.

Noodles
Konjac/shirataki noodles (in water packs), edamame noodles or black bean spaghetti (check macros carefully).

30.7. Condiments, spices and sauces

Flavour without calories. Ensure that you check labels to avoid hidden sugars or oils.

Sauces and condiments
Salsa, sugar-free ketchup, sugar-free BBQ sauce (e.g., G Hughes), sugar-free teriyaki sauce, sugar-free sweet chilli sauce, zero-calorie marinades and salad dressings (e.g., Walden Farms), mustard (Dijon, yellow, wholegrain), reduced-sodium soy sauce (or tamari), all vinegars (rice, apple cider, white, balsamic), hot sauce (Sriracha, Tabasco, Frank's RedHot), lemon/lime juice.

Dry spices and rubs
Salt (sea salt, potassium-rich Lite/LoSalt, kala namak/black salt), black pepper, cinnamon, onion powder, garlic powder,

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Italian herbs/oregano, turmeric, curry powder, chilli flakes, star anise, anise, plus any commercial dry rubs or spice blends that contain zero sugar.

30.8. Beverages and broths

Items

Water, black coffee (no cream or sugar), unsweetened teas, sugar-free/diet sodas, sugar-free drink mix powders (e.g., Crystal Light), natural water enhancers (e.g., Stur), clear chicken broth, beef broth, vegetable broth, bouillon cubes, white miso paste.

30.9. Supplements

Items

Creatine monohydrate, essential fatty acids (fish oil/algae oil), multivitamin, electrolytes (magnesium and potassium), calcium, vitamin D, prebiotics, psyllium husk, caffeine, melatonin.

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Chapter 31. The PSMF kitchen: high-volume, maximum-protein recipes

The recipes in this chapter are all PSMF-compliant, meaning that they are exceptionally high in protein while keeping carbohydrates and fats to a bare minimum.

If you are following a more flexible diet with higher macronutrient targets, then you can use these meals as a foundation. Simply add your allocated carbohydrate and fat sources to these dishes, whether that means stirring in rice, potatoes, a nut butter or avocado, topping a sweet treat with fruit and dark chocolate or cooking your proteins in olive oil. In doing so, however, ensure the following two things:

> (1) those additions are accurately tracked; and
> (2) you are adding, not replacing; swapping out the main ingredients defeats the purpose of volume eating; instead, use your extra macros to build upon that volume.

These examples are primarily here to get your creative juices flowing. In showing you how to use high-volume ingredients (xanthan gum, fluffy egg whites, cauliflower, broth, konjac/shirataki noodles) to stretch the stomach physically

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and signal fullness when energy intake is very low, I want to provide you with the tools to start experimenting and creating your own high-satiety meals.

31.1. Savoury meals

Lean proteins paired with fibrous vegetables. Eating these meals should take 15–20 minutes.

1. Lemon pepper white fish and cauli-volume
White fish is one of the most efficient protein sources for a PSMF due to its low calorie-to-protein ratio.

Ingredients
400 g hoki, cod or tilapia (white flesh fish)
500 g cauliflower rice (fresh or frozen)
Lemon juice (fresh)
Salt, black pepper, parsley

Method
1. Dry pan-fry the cauliflower rice on a high heat to remove moisture (makes it fluffier), seasoning with Lite salt.
2. Steam, microwave or pan-fry the fish (use a non-stick pan with a quick spray of oil).
3. Flake the fish into the rice.
4. Douse with fresh lemon juice and black pepper.

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Calories: 402
Protein: 79 g
Carb: 8 g
Fat: 4 g

2. Kangaroo burgers with vegetables
Kangaroo is incredibly lean and high in iron. If unavailable, then use 96% lean beef mince.

Ingredients
Four 110 g kangaroo burgers (ensure no added fillers/breadcrumbs) OR 500 g extra lean mince shaped into patties
250 g broccoli and cauliflower mix
Sugar-free BBQ sauce or mustard

Method
1. Grill the burgers.
2. Steam the vegetables until soft.
3. Chop the vegetables and mix them with the meat for a bowl-style meal or eat separately to extend the meal time.

Calories: 483
Protein: 87 g
Carb: 12 g
Fat: 9 g

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3. High-protein alfredo
Blended cottage cheese replaces heavy cream.

Ingredients
250 g low-fat cottage cheese
1 packet edamame noodles (or Konjac noodles for lower calories)
1 clove garlic (minced)
Onion powder, salt, dried chives

Method
1. Make the sauce by blitzing the cottage cheese, garlic, spices and a splash of water in a blender until completely smooth and silky.
2. Cook the noodles according to the packet instructions.
3. Toss the noodles with the sauce in a pan on a very low heat just to warm it through (do not boil the sauce or it may split).

Calories: 392
Protein: 50 g
Carb: 23 g
Fat: 8 g

4. Solomon's savoury egg white scramble
Nutritional yeast adds a cheesy, nutty flavour without the fat of cheese.

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Ingredients
500 g liquid egg whites
200 g spinach (wilted)
200 g mushrooms (sliced)
5 g nutritional yeast
Hot sauce (sriracha or tabasco)

Method
1. Sauté the mushrooms in a non-stick pan with water until they are soft.
2. Add spinach until wilted.
3. Pour in the egg whites. Cook on a low-medium heat, stirring frequently for large, fluffy curds.
4. Stir in the nutritional yeast right at the end. Top with hot sauce.

(Lazy alternative: you can combine all of the ingredients in a large microwave-safe bowl and microwave them until the egg whites are fully cooked, pausing to stir once halfway through.)

Calories: 347
Protein: 71 g
Carb: 4 g
Fat: 1 g

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5. Anti-hunger white fish soup
Liquid volume combined with protein is highly satiating.

Ingredients
400 g cod, snapper or flathead
500 ml chicken bone broth (check the label for low fat)
200 g bok choy or choy sum
Fresh ginger (sliced) and garlic
1 star anise (optional, for pho flavour)

Method
1. Simmer the broth with ginger, garlic and star anise for 10 minutes to infuse flavour.
2. Add the fish (cut into chunks) and poach for 4–5 minutes.
3. Add the greens at the last minute so that they stay crunchy.
4. Serve in a big bowl.

Calories: 541
Protein: 101 g
Carb: 5 g
Fat: 8 g

6. Zucchini noodle bolognese
Ingredients
2 large zucchinis (roughly 600–650 g), spiralized into noodles
300 g chicken breast mince or kangaroo mince

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200 g passata (tomato purée)
Italian herbs, garlic powder, sweetener (a pinch)

Method
1. Brown the mince in a non-stick pan. Break it up very finely.
2. Add the passata and herbs. Simmer until thick.
3. Add the zucchini noodles and toss for 2 minutes only (do not overcook them, or the water will seep out and make the sauce soupy).

Calories: 469
Protein: 78 g
Carb: 31 g
Fat: 6 g

7. Tuna pancakes
A savoury meal that replaces canned tuna boredom.

Ingredients
1 large can (185 g) of tuna in brine (drained well)
100 g liquid egg whites
1/2 onion (roughly 70–80 g), finely diced
Dill and lemon zest

Method
1. Mix all of the ingredients in a bowl.

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2. Heat a non-stick pan. Spoon the mixture into small patties.
3. Cook for 3 minutes per side until golden brown. Serve with mustard.

Calories: 249
Protein: 50 g
Carb: 9 g
Fat: 1 g

8. Spicy shrimp and konjac stir-fry

Ingredients

300 g shrimp/prawns (cooked, peeled)
1 packet (200 g) of konjac noodles, rinsed thoroughly
150 g capsicum (sliced)
100 g green beans (trimmed)
Sauce: 30 ml reduced-sodium soy sauce, 15 ml rice vinegar, 5 g freshly grated ginger, 2 g chilli flakes.

Method

1. Dry fry the rinsed konjac noodles to remove the fishy smell and improve the texture.
2. Add the vegetables and a splash of water to steam them.
3. Add the shrimp and sauce mixture. Toss until heated through.

Calories: 319
Protein: 54 g

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Carb: 17 g
Fat: 4 g

9. Chicken breast pizza bowl

Ingredients

300 g chicken breast (diced)
100 g mushrooms
100 g passata
Oregano, basil, chilli flakes
Optional: 20 g non-fat grated cheese (if macros allow) or nutritional yeast

Method

1. Cook the chicken and mushrooms in a pan.
2. Pour over the pizza sauce and reduce the heat.
3. Sprinkle herbs and cheese on top. Cover the pan with a lid for 2 minutes to melt/steam.

Calories: 367
Protein: 73 g
Carb: 5 g
Fat: 5 g

Note: the provided calories and macros exclude the optional cheese or nutritional yeast.

10. Shirataki chicken lo mein

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Shirataki (or konjac) noodles are 97% water and 3% soluble fibre. They contain virtually zero calories. The trick is preparing them correctly to remove the ocean smell and rubbery texture.

Ingredients
300 g chicken breast (sliced thinly)
1 packet (200 g) of shirataki/konjac noodles
200 g bok choy or broccoli
1/2 (75–100 g) red capsicum
Sauce: 45 ml reduced-sodium soy sauce, 15 ml rice vinegar, 5 g crushed garlic, 5 g grated ginger, 4 g erythritol/stevia, 2 g chilli flakes.

Method
1. Rinse the noodles thoroughly under cold water for 1 minute.
2. Place the noodles in a dry non-stick pan (with no oil) on a high heat. Cook them for 5–7 minutes until they squeak and all of the moisture has evaporated. This improves the texture. Remove and set aside.
3. In the same pan, cook the chicken breast slices until they are browned.
4. Add the vegetables and a splash of water to steam them slightly.

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5. Toss the noodles back in, pour the sauce over everything and stir-fry for 2 minutes until the noodles absorb the sauce colour.

Calories: 443
Protein: 79 g
Carb: 19 g
Fat: 7 g

11. Sashimi
Raw fish is a fantastic, zero-prep way to hit your protein targets while feeling as if you are eating at a high-end restaurant.

Ingredients
300 g sashimi-grade kingfish, tuna or snapper
200 g cucumber (sliced into thin rounds or ribbons for volume)
30 ml reduced-sodium soy sauce or tamari
Wasabi and pickled ginger

Method
1. Slice the fish thinly (if not bought pre-sliced) using a very sharp knife.
2. Arrange the fish and cucumber ribbons on a plate.
3. Mix the wasabi into your soy sauce and use it as a dip.

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Calories: 360
Protein: 66 g
Carb: 10 g
Fat: 4 g

12. Miso broth
This is not a standalone meal, but rather a low-calorie volume strategy. You can sip this bowl of savoury liquid alongside any solid meal to fill the stomach and enhance satiety.

Ingredients
1,000 ml boiling water
1 standard low-calorie bouillon cube (chicken or vegetable)
15 g white miso paste
15 ml reduced-sodium soy sauce
10 g grated fresh ginger
10 g garlic (minced)

Method
1. Dissolve the bouillon cube in the boiling water in a saucepan over medium heat.
2. Remove from the heat. Whisk in the miso paste, soy sauce, ginger and garlic until they are fully integrated.

Calories: 90
Protein: 5 g

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Carb: 12 g
Fat: 2 g

13. Perfect 60˚C sous vide chicken breast
A sous vide setup eliminates the issue of dry, rubbery chicken, keeping ultra-lean poultry juicy and tender. Because you can drop multiple chicken breasts into the water bath at once, it is also an excellent meal prep strategy.

Ingredients
300 g chicken breast
Salt, black pepper and garlic powder
Fresh thyme or rosemary (optional)

Method
1. Set a sous vide water bath to 60˚C.
2. Season the chicken generously and seal it in a vacuum bag (or a ziplock bag using the water displacement method to remove the air).
3. Cook it in the water bath for 1.5 to 4 hours.
4. Remove the chicken from the bag, pat it dry with a paper towel and sear it in a blazing hot non-stick pan for 30 seconds per side just for colour.

Calories: 318
Protein: 68 g
Carb: 1 g

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Fat: 4 g

14. The Lyle McDonald Special #1 (ham and shake)
A nod to my bodybuilding coach. When you cannot be bothered to cook, this combination gets the job done.

Ingredients
200 g premium, ultra-lean deli ham
1 scoop (30 g) whey protein isolate

Method
1. Roll up the ham slices and eat them.
2. Mix the whey protein isolate with water in a shaker bottle and drink it.

Calories: 327
Protein: 54 g
Carb: 9 g
Fat: 0 g

15. The Lyle McDonald Special #2 (canned chicken and ranch)
Canned chicken breast is convenient and portable.

Ingredients
2 cans (approx. 150 g drained weight each) canned chicken breast in water

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20 g fat-free ranch dressing
200 g broccoli and cauliflower mix
Black pepper

Method
1. Drain the canned chicken and flake it into a bowl.
2. Stir in the fat-free ranch dressing and a heavy pinch of black pepper until it resembles a chicken salad.
3. Steam or microwave the broccoli and cauliflower mix until tender and serve alongside the chicken.

Calories: 323
Protein: 54 g
Carb: 16 g
Fat: 5 g

31.2. Sweet treats

These recipes aim to mimic the texture of 'cheat' foods.

16. Protein fluff
While the inclusion of fruit disqualifies this recipe from being PSMF-compliant in the strictest sense, it earns its place here for two reasons: (1) it is still relatively low in carbohydrates; and (2) the volume it yields makes it an unparalleled tool for managing hunger.

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Ingredients

80 g casein protein powder (vanilla or berry flavour works best)
250 g frozen strawberries (must be frozen)
20 g erythritol (or sweetener to taste)
100 ml cold water
2 g xanthan gum (do not skip this)

Method

1. Place the ingredients in a large mixing bowl.
2. Mix with a stand mixer or a hand mixer for 5–10 minutes. The mixture will expand massively.
3. Eat it immediately with a spoon.

Calories: 368
Protein: 63 g
Carb: 19 g
Fat: 2 g

Note 1: the amount of protein powder can be varied to fit your specific calorie budget. Counterintuitively, reducing the powder (e.g., halving or quartering it) often yields a larger bowl of fluff. A high concentration of casein creates a denser, heavier batter that resists expansion.

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Note 2: raspberries are an effective alternative to strawberries. A 250 g substitution will add roughly 50 calories and 11 g of carbohydrates to the bowl.

17. High-fibre gut-fill shake

Even though I normally suggest avoiding liquid calories while dieting, this shake is a great choice if you are in a pinch, thanks to the added psyllium husk.

Ingredients

80 g casein protein powder
20 g psyllium husk*
5 g creatine monohydrate
600 ml water (minimum; psyllium requires fluid)
Ice cubes

Method

1. Add water and ice to a large shaker bottle first (prevents clumping).
2. Add casein, psyllium and creatine.
3. Shake vigorously and drink immediately. Psyllium gels quickly; if you wait too long, then it will become spoonable rather than drinkable.

Calories: 326
Protein: 62 g
Carb: 7 g

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Fat: 2 g

**A warning regarding psyllium husk: if your digestive system is unaccustomed to this volume of dietary fibre, then do not begin with a full 20-gram dose. Rapidly introducing this much fibre will almost certainly cause gastrointestinal distress. Instead, start with a conservative dose of 3–5 grams and gradually titrate the amount upward over several weeks as your digestive tract adapts.*

18. Protein jelly mousse

Ingredients

1 packet of sugar-free jelly crystals (raspberry or lime)
30 g whey protein isolate (vanilla)
350 g YoPro (or similar high-protein, 0% fat Greek yoghurt)
100 ml boiling water

Method

1. Dissolve the jelly crystals in the boiling water. Let it cool slightly.
2. Whisk the yoghurt and whey protein isolate together in a bowl until smooth.
3. Slowly pour the Jello liquid into the yoghurt mixture while whisking constantly.
4. Refrigerate for 2–3 hours. The result is a cheesecake-like mousse texture.

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Note: if your goal is to maximize volume, then you can prepare these ingredients separately rather than mixing them together. Simply prepare the jelly normally according to the packet instructions—which requires more water—top it with the yoghurt once set and have the whey protein isolate mixed with water as a shake to the side.

Calories: 349
Protein: 66 g
Carb: 16 g
Fat: 2 g

19. Spiced protein yoghurt bowl

Ingredients

30 g whey protein isolate (salted caramel or vanilla)
350 g YoPro (or similar high-protein, 0% fat Greek yoghurt)
Cinnamon and a pinch of salt

Method

1. Mix the whey into the yoghurt slowly to avoid powder explosions.
2. Add a small splash of water or almond milk if the texture becomes too cement-like.
3. Top it with cinnamon and sea salt.
4. Place it in the freezer for 20 minutes before eating for a frozen-yoghurt texture.

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Calories: 342
Protein: 65 g
Carb: 16 g
Fat: 2 g

20. Chocolate casein cookie dough

Ingredients

40 g chocolate casein protein powder
10 g cocoa powder (unsweetened)
15 g PB2 (powdered peanut butter)
A small splash of water or unsweetened almond milk
Erythritol/stevia drops

Method

1. Mix the dry ingredients in a small bowl.
2. Add the liquid literally 1 teaspoon at a time, mixing constantly. You want a thick sludge.
3. Once it forms a dough ball, eat it with a spoon.

Calories: 237
Protein: 39 g
Carb: 8 g
Fat: 4 g

21. Sweet baked egg whites

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Egg whites are incredibly versatile. Baking them with a zero-calorie sweetener creates a dense, cake-like dish that can satisfy dessert cravings without breaking the diet.

Ingredients
300 g liquid egg whites
1 tbsp zero-calorie sweetener (erythritol or stevia)
1 tsp vanilla extract
Cinnamon and nutmeg (to taste)

Method
1. Preheat your oven to 180°C.
2. In a bowl, whisk the egg whites, sweetener, vanilla, and spices until slightly frothy.
3. Pour the mixture into a small non-stick baking dish.
4. Bake the mixture for 20–25 minutes until it is puffed and golden brown on top.

Calories: 148
Protein: 34 g
Carb: 1 g
Fat: 0 g

31.3. The vegan PSMF kitchen

A plant-based PSMF is most efficiently executed by relying almost entirely on protein powders (see §14.10). However, for

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vegans who must incorporate solid food, the recipes here are designed to minimize tag-along carbs and fats while maximizing protein bioavailability.

31.3.1. Savoury (vegan)

22. TVP bolognese
Textured Vegetable Protein (TVP) expands when rehydrated.

Ingredients
60 g dry TVP (Textured Vegetable Protein) granules
240 ml vegetable broth (hot)
200 g passata/tomato purée
200 g zucchini (grated or spiralized)
15 ml reduced-sodium soy sauce (for umami depth)
Italian herbs, garlic powder, onion powder

Method
1. Soak the dry TVP in the hot broth for 5–10 minutes until fully expanded.
2. In a non-stick pan, add the rehydrated TVP, passata, spices and soy sauce.
3. Simmer until the sauce thickens.
4. Stir in the zucchini right at the end to keep it crunchy or serve the sauce over zucchini noodles.

Calories: 310

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Protein: 37 g
Carb: 40 g
Fat: 2 g

23. Seitan chicken stir-fry
Vital wheat gluten (seitan) is almost pure protein. If you buy store-bought seitan, then check the label strictly for added oils.

Ingredients
150 g seitan (sliced into strips)
300 g broccoli florets
100 g mushrooms
Sauce: 30 ml reduced-sodium soy sauce, 15 ml rice vinegar, 5 g ginger (minced), 5 g garlic, 4 g erythritol/stevia, 2 g chilli flakes.

Method
1. Steam or dry-fry the broccoli and mushrooms until tender.
2. In a separate non-stick pan, brown the seitan strips (use a quick spray of oil if needed).
3. Add the vegetables and the sauce mixture to the seitan pan.
4. Toss on high heat for 1 minute to glaze the protein.

Calories: 379
Protein: 66 g

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Carb: 26 g
Fat: 2 g

24. Tofu egg scramble
Use firm tofu for this. While tofu contains some fat, it is acceptable if it fits your daily macros. This recipe mimics the sulfurous taste of eggs using black salt (kala namak).

Ingredients
250 g firm tofu (pressed to remove water)
4 g nutritional yeast
1/2 tsp turmeric (for colour)
1/2 tsp kala namak (black salt; provides an egg flavour)
200 g spinach or kale

Method
1. Crumble the block of tofu with your hands into a bowl. Mix in the turmeric, nutritional yeast and black salt.
2. Heat a non-stick pan. Add the crumbled tofu mixture.
3. Cook for 5–7 minutes, stirring frequently, until the water evaporates and the texture becomes firmer.
4. Toss in the spinach and wilt it. Serve the meal with hot sauce.

Calories: 428
Protein: 49 g
Carb: 11 g

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Fat: 20 g

31.3.2. Sweet (vegan)

25. Silken tofu chocolate mousse

Do not let the tofu scare you. When blended, silken tofu creates a custard-like texture that carries chocolate flavours perfectly. Use light or low-fat silken tofu if available.

Ingredients

300 g silken tofu (drained)
30 g vegan protein powder (chocolate or vanilla soy protein isolate works best for texture)
20 g cocoa powder (unsweetened)
Liquid stevia or erythritol to taste

Method

1. Place all of the ingredients in a blender or food processor.
2. Blend them on high until the mixture is completely smooth and the grainy protein texture disappears.
3. Chill the mixture in the fridge for at least 1 hour to let it set.

Calories: 322
Protein: 42 g
Carb: 6 g
Fat: 12 g

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26. Vegan sludge bowl

Pea-and-rice protein blends often absorb more liquid than whey protein powder. We use this to our advantage to create a cookie-dough consistency.

Ingredients

40 g vegan protein powder (a pea-and-rice blend is usually thickest)
10 g peanut butter powder (PB2 or similar defatted peanut flour)
100 ml unsweetened almond milk (add slowly)
Cinnamon

Method

1. Mix the dry powders in a bowl.
2. Add the almond milk a splash at a time, stirring constantly. Stop when the mixture reaches a thick, dough-like consistency.
3. Optional: mix in 5 g of cacao nibs for crunch (minimal calories).

Calories: 222
Protein: 35 g
Carb: 6 g
Fat: 6 g

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27. Strawberry soy fluff
A vegan version of the casein fluff. Soy isolate mimics the thickening properties of dairy better than pea protein.

Ingredients
40 g soy protein isolate
250 g frozen strawberries
100 ml water or unsweetened almond milk
2 g xanthan gum (essential)

Method
1. Place the ingredients in a large mixing bowl.
2. Mix with a stand mixer or a hand mixer for 5–10 minutes. The mixture will expand massively.
3. Eat it immediately with a spoon.

Calories: 227
Protein: 38 g
Carb: 15 g
Fat: 0 g

Note: the provided calories and macros use water instead of unsweetened almond milk.

31.4. Zero-calorie enhancers

Do not eat bland food. Use these freely:

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- Acids: lemon juice, lime juice, apple cider vinegar, white vinegar, rice vinegar, balsamic vinegar.
- Heat: tabasco, sriracha (check sugar content), chilli flakes, cayenne pepper, fresh hot peppers (jalapeño, serrano, fresno), fresh wasabi, fresh horseradish, fresh ginger root, Frank's RedHot, black pepper.
- Umami and salty: reduced-sodium soy sauce, tamari, fish sauce, MSG, sea salt, potassium-rich salt (Lite/LoSalt), kala namak (black salt), bouillon cubes, clear broths (chicken, beef, vegetable).
- Sweet: erythritol, stevia drops, sucralose (Splenda), sugar-free maple syrup.
- Sauces and condiments: mustard (Dijon, yellow, wholegrain), salsa, sugar-free ketchup, sugar-free BBQ sauce (e.g., G Hughes), sugar-free teriyaki sauce, sugar-free sweet chilli sauce, zero-calorie marinades, zero-calorie salad dressings (e.g., Walden Farms).
- Aromatics and fresh herbs: garlic, onions (brown and red), scallions (spring onions), shallots, chives, leeks, basil, coriander (cilantro), mint, parsley, rosemary, thyme, oregano, dill, lemon grass, other leafy herbs.
- Dry spices and rubs: garlic powder, onion powder, cinnamon, turmeric, curry powder, Italian herbs, star anise, unsweetened cocoa powder, commercial dry rubs/spice blends (must contain zero sugar).

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Chapter 32. Keeping it off for good

In the fitness industry, we are frequently sold a fat-loss story that ends at the after photo. However, the reality is that reaching your goal weight is not the conclusion of the journey but rather a transition into a different yet often equally challenging phase: maintenance.

The statistics surrounding weight maintenance are frequently cited and undeniably sobering, with a majority of people regaining lost weight within a few years.[220] This phenomenon makes sense, both physiologically and psychologically. On the physiological front, your body views weight loss as a threat, fighting to reclaim lost energy stores through increased hunger and a slowed metabolism. Simultaneously, once having achieved fat reduction, the psychological incentives that drove your journey—the dopamine hit of a dropping scale weight, the compliments and the thrill of progress—abruptly disappear. Once the goal is reached, the excitement evaporates. Without the immediate reward of seeing visible results, the daily disciplines that got you there can begin to feel like an unnecessary burden. It is in this vulnerable state, where motivation has naturally waned and

[220] Anderson, J. W., Konz, E. C., Frederich, R. C., & Wood, C. L. (2001). Long-term weight-loss maintenance: a meta-analysis of US studies. *The American Journal of Clinical Nutrition*, *74*(5), 579–584. https://doi.org/10.1093/ajcn/74.5.579

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biological hunger has peaked, that one often slides back into the comfortable, automatic behaviours of the past. To keep the weight off for good, you have to shift your mindset from the aggressive offence of dieting to the strategic, habit-based defence of maintenance. This chapter outlines the strategy of that defence, aiming to cultivate a lifestyle that is resilient against weight regain.

32.1. Maintaining the guardrails

On paper, maintenance is easier than dieting. You have a larger calorie budget and less biological pushback from a starving body. Yet, as we have established, it is a phase that still requires an immense amount of discipline to sustain successfully.

A helpful mental framework is to view maintenance not as a completely separate, unstructured paradigm, but simply as a more generous iteration of your fat-loss diet. In practice, this means continuing with the same habits that got you lean, just with a bit more breathing room. It is essentially a fat-loss diet that is more generous with carbohydrates and fats, and a little less fussy about protein.

There is a common adage in the fitness industry: ‘you only have to get lean once’. If you remain disciplined during your maintenance phase, then that statement is completely true.

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Defending a territory requires far less energy than conquering it, but it still requires you to man the walls and remain vigilant.

32.2. Monitoring and the NWCR

One of the most robust sources of wisdom on long-term maintenance comes from the National Weight Control Registry (NWCR). This ongoing study tracks thousands of people who have lost significant amounts of weight and kept it off for years. When researchers analyse the habits of these successful losers, one specific behaviour stands out above the rest: they are vigilant monitors of their bodies.

Contrary to the popular sentiment that one should ditch the scale to preserve mental peace, the data suggest that regular monitoring is crucial to success. In the NWCR, most successful maintainers weigh themselves at least once a week and often daily.[221] This practice is about feedback loops. Weight regain is often a slow, creeping tide. It happens in increments of ounces that go unnoticed until they accumulate into pounds. Regular engagement with the scale can prevent this. If the trend line of that weekly average begins to creep upward, then you can implement a calm,

[221] Klem, M. L., Wing, R. R., McGuire, M. T., Seagle, H. M., & Hill, J. O. (1997). A Descriptive Study of Individuals Successful at Long-Term Maintenance of Substantial Weight Loss. *The American Journal of Clinical Nutrition*, *66*(2), 239–246.

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measured correction immediately. If you avoid the scale for six months, then you may be confronted with a reality that requires a monumental effort to reverse.

32.3. Setting an upper limit

Regular monitoring is only useful if it triggers an action. This brings us to the strategy of setting an upper limit, sometimes referred to as a red line. It is unrealistic to expect your weight to remain at a single static number for the rest of your life. Fluid retention, digestion, hormonal fluctuations and inflammation cause daily variances. Therefore, you should establish a permissible fluctuation range, typically 1 to 3% above your goal weight.

For a person maintaining at 70 kilograms, an upper limit might be set at 72 kilograms. This range is your green zone. As long as your weight fluctuates within these bounds, you continue with your standard maintenance habits. However, the moment the scale touches that upper limit, a pre-determined protocol is activated. This is the key to the upper limit strategy: the decision is made in advance. You do not negotiate with yourself when you hit the number; you simply execute the plan that you created when you were calm and rational.

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Applying this limit requires immediate, non-judgemental action. When the limit is breached, you might immediately switch to a higher protein intake, cut out liquid calories, resume tracking and/or return to a PSMF for a few days. The specific tactic you use to re-enter a deficit matters less than the immediacy of the response. This prevents a slip from becoming a slide. It turns a potential relapse into a minor correction, reinforcing the belief that you are in control, even when things do not go to plan.

32.4. The case for continued tracking

When the goal weight is reached, the temptation may be to delete the food tracking app. We often equate tracking strictly with the restriction of the diet phase, assuming that maintenance means relying purely on a suddenly perfected sense of intuition. However, just as your biological hunger signals are compromised post-diet, your visual intuition is easily warped by our modern food environment.

You do not need to take tracking to the extremes that I do. You are not required to bring a digital food scale to restaurants and social gatherings. But discarding the habit entirely removes your most objective tool. Continued tracking—even in a relaxed, estimative format—provides a reliable boundary that prevents your daily intake from expanding unchecked.

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Over time, portion distortion can occur. A measured tablespoon of peanut butter slowly morphs into two; a sensible splash of cooking oil becomes a heavy pour. Without a log, this insidious caloric creep goes unnoticed until it shows up on the scale. Continuing to track your calories and macronutrients removes the guesswork from maintenance. If your weight begins to approach the red line established in the previous section, then your food log provides the diagnostic data required to see where the extra energy is sneaking in.

32.5. Nutritional volume and protein prioritization

In the maintenance phase, hunger remains a primary adversary. To combat this, your nutrition should still rely on the principles of volume eating and protein prioritization. Centring your plate around a solid source of protein and filling the remaining space with high-volume plants lets you create an environment where it is more difficult to overeat.

32.6. The art of environmental design

Willpower is a finite resource, one that depletes as the day wears on. Relying on willpower to resist temptation in your own home is a strategy destined for failure. Successful

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maintainers understand the power of choice architecture; the practice of designing your environment to make the desired behaviour the easiest option and the undesired behaviour the most difficult.

This begins in the grocery store, but it is executed in the kitchen. If a food is in your house, then you will likely, eventually, eat it. Therefore, hyper-palatable trigger foods should be kept out of the home environment. If you crave ice cream, then you are free to have it, but you should have to walk to the gelateria to get a single serving. That additional step is often enough to deter acting on a craving. Conversely, healthy choices should be the path of least resistance. Washed fruit should be visible in a bowl on the counter, while chopped vegetables should be at eye level in the refrigerator. Curating your surroundings lets you reduce the cognitive load required to make healthy choices. You want to be in an environment designed for your success.

32.7. Navigating social settings

While you can control your kitchen, you cannot control the world. Social situations and food pushers pose substantial difficulties for long-term maintenance. Food is central to how we bond; just try to recall a social gathering that did not involve food or drink (you will likely struggle). Because of

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this, turning down a plate can feel like a personal rejection of the host.

Handling these situations requires a blend of firm boundaries and social grace. It is helpful to visualize your response before you arrive at the event. When faced with a food pusher—the aunt who insists that you try her casserole or the colleague urging you to have a slice of cake—you should have a script ready. A simple, polite ‘it looks delicious, but I’m not hungry right now, perhaps later’ is often effective. If the pressure persists, then remember that ‘no, thank you’ is a complete sentence. You do not owe anyone an explanation for what you choose to put in your body.

Further, navigate these events by focusing on the social interaction. Stand away from the food table to avoid mindless grazing. Hold a drink (sparkling water with lime is a great decoy) in your dominant hand so that it is harder to reach for hors d'œuvres. If you decide to indulge, then do so consciously. Select the one item that you truly desire, eat it slowly, savour it and move on. Maintenance is largely about keeping those indulgences as purposeful choices.

32.8. Pro-active and reactive calorie cycling

A rigid adherence to a single calorie number every day can be brittle and prone to breaking. Life is undulating, with

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weekends and holidays requiring more flexibility. To maintain weight long-term, one effective strategy is to cycle your calories to manage these natural spikes, which can be done either pro-actively or reactively.

As noted in chapter 12, calorie intake should be viewed as a weekly average. If you know that you have a dinner out on Saturday and a family brunch on Sunday, then you can pro-actively lower your intake on Monday, Tuesday and Wednesday to offset the anticipated surplus of those events. This might look like skipping a snack, slightly reducing portion sizes at dinner, leaning more heavily into volume eating on those days or even integrating a PSMF day or two. This is a deposit into your caloric bank account. Undereating on days where food is less central may give you the freedom to enjoy higher calorie events without anxiety.

However, for some people, pro-active cycling can create hunger and a sense of entitlement, leading to overindulgence at the weekend event simply because you feel you have earned it. If you find that banking calories triggers overeating, then a reactive approach is the better strategy.

Instead of restricting in advance, you aim to eat mindfully and perhaps slightly less on the day of the event itself. Then, if you still end up slightly over your maintenance target, you reactively lower your calories for the next day or two to

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balance out the weekly average. Because you did not approach the event with a starved, compensatory mindset, the actual surplus may be smaller. Consequently, the ensuing correction may be minor and easier to manage.

This concept of strategic cycling is also an effective way to transition out of a diet. The standard advice to jump immediately back to maintenance calories may work for some. However, for many people, this sudden release of the brakes causes the car to careen off the road. Once you fully exit diet mode, it is all too easy to lose control entirely. Keeping at least one or two PSMF days in your weekly rotation can maintain a psychological anchor. You keep one foot in the structure of the diet, which prevents the on/off switch from flipping completely.

Instead of jumping to maintenance all at once, you might pick just one or two days a week to raise your calories to see how you handle the increased food volume before adding more. Alternatively, you can manipulate daily timing by keeping your breakfast and lunch low-calorie—relying on protein and vegetables—to allow yourself a full, maintenance-style dinner every night.

Ultimately, maintenance is a skill. We all require personal strategies to navigate the abundance of food in the modern world. My own strategy, for instance, is to continue weighing

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every meal with a food scale and tracking my calories and macronutrients. While I acknowledge that my method is not suitable for everyone, it provides the accountability that I personally need. You should experiment to find the structure that works for you. One that permits flexibility without compromising long-term weight control.

32.9. Handling slip-ups and regressions

Finally, no chapter on maintenance would be complete without addressing the inevitable: you will mess up. You will have days, perhaps weeks, where you revert to old habits, which may manifest as overeating or skipping your scheduled workouts. The difference between those who maintain their weight and those who regain it lies in how they interpret these slip-ups.

Failed maintainers view a slip-up as a total collapse. They eat a bad meal, decide they have ruined their diet and proceed to turn a bad meal into a bad week. This is the flat tyre phenomenon: imagine getting a flat tyre on the highway and responding by slashing the other three tyres. It sounds absurd, yet we do this with our nutrition constantly.

Successful maintainers practice resilience and immediate forgiveness. They understand that perfection is not the goal; consistency is. When a slip-up occurs, they acknowledge it

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without judgement and immediately return to their established behaviours at the very next meal. They acknowledge that one salad does not make them skinny just as one pizza does not make them fat. It is the accumulation of choices over time that determines your weight. Refusing to let a stumble become a fall ensures that maintenance is a lifelong journey of self-correction, growth and sustainable health.

However, what happens if a stumble does become a fall? You might face a prolonged period of stress or personal upheaval and experience a major regression. You might, to put it bluntly, screw up bigly.

If you find yourself having regained a significant amount of weight and well past your established red line, then it is vital to remember one immutable fact: you have done this before. You are no longer the inexperienced beginner wondering if fat loss is even biologically possible for you. You have already proven that you possess the grit and the knowledge required to transform your body. The physiological mechanisms of fat loss have not changed, and the same tools that worked for you the first time are still available to you. Forgive yourself for the regression and simply restart the process. You got lean once before, so you can assuredly do it again.

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32.10. Key takeaways

- View maintenance as a generous diet. It requires just as much discipline as fat loss, but it affords you more carbs and fats and is less rigid about perfect protein intake. Remember: you only have to get lean once if you maintain this discipline.
- Practice vigilant monitoring. Regular scale use (preferably daily) provides a necessary feedback loop to detect and correct slow, creeping weight regain immediately.
- Establish a non-negotiable upper limit or red line (1–3% above your goal weight); hitting this threshold should trigger a pre-determined, immediate action (e.g., dieting for three days) to prevent a slip from becoming a slide.
- Maintain the practice of tracking. You do not need to be extreme, but tracking calories and macronutrients provides a boundary against portion distortion and provides objective data to help you course-correct when your weight fluctuates.
- Combat persistent hunger by using volume eating principles (prioritizing low-calorie-density foods) and centring every meal around a solid source of protein for satiety.
- Employ environmental design to conserve willpower by making healthy choices the path of least resistance

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(e.g., by having healthy food visible) and making trigger foods difficult to access (e.g., by keeping them out of the home).

- You might benefit from pro-active or reactive calorie cycling—integrating lower-calorie days—to create a flexible weekly budget that buys the freedom to enjoy social events and higher-calorie days without guilt or losing control.
- Practice resilience when slip-ups occur. Successful maintainers forgive the mistake and immediately return to their established plan at the very next meal, refusing to let a single bad moment become a total collapse.
- If you experience a major relapse and regain weight, then remember that your past success is proof of your capability. You have gotten lean once before, and you can assuredly do it again.

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Chapter 33. Conclusion

As befits a book on fat loss, I wanted this text to be lean and free of indulgence. A part of this economy is recognizing that enough has been said for what needs to be done.

At the beginning of this book, I asked what the best way to lose fat is. Now, you have the answer. We have unpacked the causes of fat loss, moving from the abstract laws of thermodynamics to the granular details of macronutrient partitioning, the application of resistance training to preserve and build lean tissue and other behavioural strategies that help to sustain a deficit. You now hold the blueprint; and if ever you were seduced by clever marketing in the past, you would now be disabused that there is no magic pill, no secret metabolic state, no superfood and no optimal nutrient timing window that will bypass the energy balance equation. Against those illusions, you now have the methods to manipulate your body composition at will, without the need for expensive consultants or endless subscriptions to fad diet programs.

However, in concluding, I want to leave you with one final, perhaps counterintuitive, thought: the ultimate goal of fat loss is to stop thinking about fat loss.

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For many of us, dieting occupies an unwelcome amount of headspace. We become preoccupied with dieting in ways that are sometimes intrusive and unrewarding. Economically speaking, the fitness industry profits from your perpetual dissatisfaction; it relies on you remaining an unrequited dieter, forever chasing a slightly better version of yourself that could be achieved if you could only shed another two kilograms. And possibly that is correct: you may well look and feel a whole lot better once you have reached your goal weight and see your abs. Nothing else in your life may change, but you unconsciously hope that with this one objective clinched, other anxieties will recede and your confidence will flourish.

I make these reflections because fat loss sits among other hopes and wishes that we create for ourselves. I dare say that for achieving any one of them it helps to make our peace with all of them. It is beyond the scope of this book to explain how a dieting regime could possibly intersect with relationship problems, job fulfilment or balancing a bank account; but it helps to believe that success at any one of these propitiates the others, and when it comes to achieving a lower body fat percentage, you have what it takes right here in your hands.

You have the metrics, the understanding and the tools. Fat loss is something within your control, unlike so many other

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areas in life with chaotic and unfair variables. My hope is that this book has served its purpose: to make me, and people like me, obsolete in your fat loss journey. From now on, you are your own coach. A leaner physique lies within reach and with it, I trust, a verifiable and empowering conviction that you can, to a substantial degree, change yourself in any direction that is worthy.

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